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6a. NAME OF PERFORMING ORGANIZATION
CH2M HILL SOUTHEAST, INC.

6b. OFFICE SYMBOL *(If applicable)*
/

7a. NAME OF MONITORING ORGANIZATION
USAFOEHL/TSS

6c. ADDRESS *(City, State, and ZIP Code)*
7201 N.W. 11th Place
P.O. Box 1647
Gainesville, Florida 32602

7b. ADDRESS *(City, State, and ZIP Code)*
Brooks AFB, Texas 78235-5501

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USAFOEHL

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Brooks AFB
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10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.

11. TITLE *(Include Security Classification)*
Installation Restoration Program, Phase II--Confirmation/Quantification Stage 2, Moody Air Force Base, Georgia

12. PERSONAL AUTHOR(S)
CH2M HILL SOUTHEAST, INC.

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Final

13b. TIME COVERED
FROM Oct. 86 TO Nov. 87

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16. SUPPLEMENTARY NOTATION

17. COSATI CODES

FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS *(Continue on reverse if necessary and identify by block number)*
Installation Restoration Program,
Groundwater, ~~BOL~~ Soils, hazardous materials,
Surface water, Landfills, Sediments,

19. ABSTRACT *(Continue on reverse if necessary and identify by block number)*

This Phase II, Stage 2 Installation Restoration Program Confirmation/Quantification survey for Moody Air Force Base, Georgia investigated four sites: Site 1, Southwest Landfill; Site 2, an underground waste fuel storage area; Site 3, the flight line storm drainage outfall area; and, Site 4, the Moody AFB water supply well at the Grassy Pond annex. Sites 1 and 4 required additional investigation as a result of the Phase II, Stage 1 investigation conducted in 1985. Sites 2 and 3 were investigated for the first time during this Stage 2 effort.

The scope of work consisted of conducting hydrogeologic investigations at Sites 1 and 2, and water quality sampling and analyses at Sites 1, 2, 3, and 4. Three deep (80 feet) wells and six shallow (30 feet) wells were installed around the perimeter of the Site 1 landfill. Seven temporary wellpoints, one standard penetration test boring, and four shallow monitor

over

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22a. NAME OF RESPONSIBLE INDIVIDUAL
Major Clegg

22b. TELEPHONE *(Include Area Code)*
512-536-2158

22c. OFFICE SYMBOL
USAFOEHL/TSS

DD FORM 1473, 84 MAR — 83 APR edition may be used until exhausted. All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE

(1)

19. ABSTRACT (continued)

cont'd

wells (30 feet) were installed at the Site 2 waste fuel storage area. Groundwater quality samples were collected from all of the new wells at Sites 1 and 2, from two of the existing monitor wells at the Site 1 landfill, and from Moody water supply well No. 7 near Site 1. Water level, organic vapor, and floating product thickness measurements were performed on the temporary wellpoints at Site 2. Four soil samples were collected during the standard penetration test at Site 2. Surface water samples and sediment samples were collected from five different locations which could have been affected by the Site 3 flight line storm drainage outfall. Groundwater quality samples were collected from the Site 4 water supply well No. 10.

Results of the investigations were evaluated and recommendations for site classification pursuant to USAFOEHL categories were developed:

- Groundwater at Site 1 contains low levels of VOCs, cresol, naphthalene, and phenols. Levels of chromium and cadmium are above MCLs in some wells. Although no significant threats to human health or environmental quality appear imminent, additional monitoring is recommended (Category 2 classification).

- Groundwater at Site 2 is contaminated with VOCs. No floating JP-4 plume appears to exist. The unsaturated zone contains significant levels of hydrocarbons which probably serve as a continual source of contamination. Because benzene (a known human carcinogen) is present, the site is recommended for Category 3 classification and remedial action alternatives are tentatively identified.

- Sediments at Site 3 contain significant levels of petroleum hydrocarbons and lead concentrations are elevated. Surface waters do not contain significant levels of VOCs, petroleum hydrocarbons, or lead. Additional data are necessary to fully evaluate public health implications. The site is therefore recommended for Category 2 classification and additional monitoring.

- Groundwater from the Site 4 water well No. 10 contains no VOCs. Because it remains unclear whether levels of THMs previously measured are a recurring problem, additional monitoring is recommended (Category 2 classification).

gnR301B/043

Keywords:

Appendix A
DEFINITIONS, NOMENCLATURE, ACRONYMNS,
AND UNITS OF MEASURE

AFB	Air Force Base
ASTM	American Society of Testing and Materials
ATC	Air Training Command
atm-m^3/mol	Atmospheres-meters Cubed per Mole
Base Personnel	Moody AFB Civil and Bioenvironmental Engineering Staff
bls	Below Land Surface
BNE	Base Neutral Extractable Organic
cm/sec	Centimeters per Second
COD	Chemical Oxygen Demand
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DOC	Dissolved Organic Carbon
DPDO	Defense Property Disposal Office
°F	Degrees Fahrenheit
Field Hydrogeologist	CH2M HILL Resident Hydrogeologist During Drilling, Boring, and Testing Work
Field Technicians	CH2M HILL Water Quality Sampling Personnel
ft	Feet
ft/d	Feet per Day
ft/ft	Feet per Feet
ft/yr	Feet per Year
gpm	Gallons per Minute
gal/yr	Gallons per Year
HARM	Hazard Assessment Rating Methodology
IRP	Installation Restoration Program
JP-4	Jet Fuel
K_{oc}	Soil Adsorption Coefficient
K_{ow}	Octanol-water Partition Coefficient
MAFB	Moody Air Force Base
MCL	Maximum Contaminant Level
mgd	Million Gallons per Day
mg/kg	Milligrams per Kilogram
mg/l	Milligrams per Liter
msl	Mean Sea Level
NGVD	National Geodetic Vertical Datum
POL	Petroleum, Oil, and Lubricants
PPMS	Priority Pollutant Metals Scan
Program Manager	USAFOEHL Project Coordinator and Contact
Project Hydrogeologist	CH2M HILL Lead Hydrogeologist for Project
Project Manager	CH2M HILL Project Coordinator and Contact
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
RAA	Remedial Action Alternative
Rebar	Reinforcing Steel Bar
Senior Hydrogeologist	CH2M HILL Registered Geologist (Georgia), Technical Point of Contact, and Quality Assurance Reviewer
SOW	Statement of Work
SP GR	Specific Gravity
SPT	Standard Penetration Test
SS	Suspended Solids
Subcontractor	Liberty Drilling, Boring and Testing, Inc.

TAC	Tactical Air Command
TCE	Trichloroethane
TDS	Total Dissolved Solids
TFW	Tactical Fighter Wing
THM	Trihalomethane
TOC	Total Organic Carbon
TOP	Technical Operations Plan
TOX	Total Organic Halogens
µg/kg	Micrograms per Kilogram
µg/l	Micrograms per Liter
µmhos/cm	Micromhos per Centimeter
USAFOEHL	United States Air Force Occupational and Environmental Health Laboratory
VOC	Volatile Organic Compound
WAR	Water and Air Research, Inc.

Appendix B
TASK ORDER AND STATEMENT OF WORK

CONTRACTOR'S COPY

REF [illegible] 55X

ORDER FOR SUPPLIES OR SERVICES

1. PAGE 1 OF 22

2. PROC INSTRUMENT ID NO. (PIIN): F33615-85-D-4535
Mark all packages & papers with this number.

3. CALL/ORDER NO.: 0002

4. DATE OF ORDER*: 86SEP26

5. REQUISITION/PURCHASE REQUEST PROJECT NO.: FY7624-86-01606

6. CERTIFIED FOR NATIONAL DEFENSE UNDER DO-S1 — DOC REG 2/DMS REG 1 RATING

7. ISSUED BY — CODE FQ8419
DEPARTMENT OF THE AIR FORCE
AIR FORCE SYSTEMS COMMAND
AERONAUTICAL SYSTEMS DIV/PMRSC
WRIGHT-PATTERSON AFB OH 45433-6503
CONTRACT NEGOTIATOR:
ERIC M. STARK
PHONE: (513)-255-5616

8. ADMINISTERED BY — CODE S1002A
DCASMA ORLANDO
3555 MAGUIRE BLVD.
ORLANDO FL 32803-3726

9. CONTRACTOR NAME AND ADDRESS — CODE 2T460 — FACILITY CODE
CH2M HILL SOUTHEAST INC.
7201 N.W. 11TH PLACE
P.O. BOX 1647
GAINESVILLE FL 32602

PHONE: (904)-377-2442
COUNTY: ALACHUA

MAILING DATE
SEP 30 1986
DUPLICATE ORIGINAL

10. MAIL INVOICES TO

11. DISCOUNT FOR PROMPT PAYMENT
1ST N % ___ DAYS — NET ___ DAYS — OTHER — IF "9" SEE SECT "G"
2ND ___ % ___ DAYS
3RD ___ % ___ DAYS

12A. PURCHASE OFFICE POINT OF CONTACT: LQQ/L72/LQQ

12B. RESERVED FOR SERVICE/AGENCY USE

13. PAYMENT WILL BE MADE BY — CODE S1102A — IF "9" SEE SECT "G"
DCASR ATLANTA
805 WALKER ST.
MARIETTA GA 30060-2789

14. TYPE CONTRACTOR: A

15. SECURITY A. CLAS: U — B. DATE OF DD 254

16. CONTRACT ADMINISTRATION DATA — A. FAST PAY; B. CONTRACT (1) KIND 0 (2) TYPE Y; C. ABSTRACT RECIP ADP POINT; D. SPL CONT PROVISIONS; E. CONT ADMIN FUNC LMT

17. (RESERVED)

18. SVC/AGENCY USE

19. SURV CRIT: C

20. TOTAL AMOUNT: NOT-TO-EXCEED $ 177,830.00

21. APPROPRIATION AND ACCOUNTING DATA
A. ACTY: 0 — B. ACRN: AA — C. APPROPRIATION: 5763400 — D. LIMIT SUBHEAD
E. SUPPLEMENTAL ACCOUNTING CLASSIFICATION: 306 4740 5H4499 N01207 59200 000000 528500
F. CPN RECIPIENT DODAAD: F28500 — G. OBLIGATION AMOUNT: $177,830.00
H. NON-CLIN/ELIN PAYMENT PROV — I. SVC AGENCY USE: FY7624-86-01606

22A. TYPE OF ORDER
DELIVERY X — B. NON-DOD CONTRACT NO. This delivery order is subject to instructions contained on this side of form only and is issued in accordance with and subject to terms and conditions of above numbered contract, or Non-DOD Contract No.

PURCHASE — Reference your ___ furnish the following on terms specified herein, including, for U.S. purchases, General Provisions of Purchase Order on DD form 1155 (EXCEPT CLAUSE NO. 13 APPLIES ONLY IF THIS BOX IS CHECKED, AND NO. 15 IF THIS BOX [ ] IS CHECKED), special provisions ___ and delivery as indicated. This purchase is negotiated under authority of 10 USC 2304(a)( ) or as specified in the schedule if within the U.S., its possessions or Puerto Rico; if otherwise, under 2304(a)(6).
[ ] If checked, Additional General Provisions apply. [illegible] shall sign "Acceptance" on DD Form 1155 and return [illegible] copies.

*If quantity accepted by the Government is same as quantity ordered, indicated by ✓ mark. If different enter actual quantity accepted below quantity ordered and encircle.

23. UNITED STATES OF AMERICA
Howard E. Marks Jr. 9/26/86
HOWARD E. MARKS JR. (YYMMDD)
BY: NAME OF CONTRACTING/ORDERING OFFICER AND DATE

24. TOTAL
25. DIFFERENCES

26. QUANTITY ORDERED HAS BEEN [ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS STATED

27. SHIP NO. — 28. D.O. VOUCHER NO. — 29. INITIALS

[ ] PARTIAL [ ] FINAL

31. PAID BY — 32. Amount Verified Correct For

DATE — SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

30. PAYMENT [ ] COMPLETE [ ] PARTIAL [ ] FINAL

33. CHECK NUMBER

35. I CERTIFY THIS AMOUNT IS CORRECT AND PROPER FOR PAYMENT
SIGNATURE AND TITLE OF CERTIFYING OFFICER

34. BILL OF LADING NO.

36. RECEIVED AT — 37. RECEIVED BY — 38. DATE RECEIVED — 39. TOTAL CONTAINERS — 40. S/R ACCOUNT NUMBER — 41. S/R VOUCHER NO.

PREVIOUS EDITION IS OBSOLETE.

AFSC FORM 700 AUG 80

*When used as a formal contract this will be the effective date.

AFSC—Andrews AFB Md 1980

PART I SECTION B OF THE SCHEDULE
SUPPLIES LINE ITEM DATA

1. PROC INSTRUMENT ID NO. (PIIN): F33615-85-D-4535
2. SPIIN: 0002
3. PAGE 2 OF 22

4. ITEM NO.: 0001
5. QUANTITY*: 1
6. PURCH UNIT: LO
7. UNIT PRICE: $ N
8. TOTAL ITEM AMOUNT*: $ N
9. SCTY CLAS: U
10. ACRN: AA
11. NSN: N
12. FSCM AND PART NUMBER
13. CIRR
14. SITE CODES: A. PQA D; B. ACP D; C. FOB D
15. NOUN: SAMPLING, ANALYSIS AND DATA
16. SVC/AGENCY USE
17. PR/MIPR DATA: FY7624-86-01606
18. AUTHORIZED RATE: A. PROGRESS PAY %; B. RECOUP %
19. CONTRACT PERCENT FEE %
20. SVC ID NO.
21. ITEM/PROJ MGR: FY7624
22. 1ST DISCOUNT A. %; B. DAYS
23. 2ND DISCOUNT A. %; B. DAYS
24. 3RD DISCOUNT A. %; B. DAYS
25. NET DAYS
26. QUANTITY VARIANCE A. OVER %; B. UNDER %
27. TYPE CONTRACT
28. OPR
29. DESCRIPTIVE DATA

CONDUCT WORK IAW THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT. SUBMIT DATA IAW ATTACHMENT# 1 , THE CONTRACT DATA REQUIREMENTS LIST OF THE BASIC CONTRACT, AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION.

4. ITEM NO.: 0002
5. QUANTITY*: 1
6. PURCH UNIT: LO
7. UNIT PRICE: $N
8. TOTAL ITEM AMOUNT*: $N
9. SCTY CLAS: U
10. ACRN: AA
11. NSN: N
12. FSCM AND PART NUMBER
13. CIRR
14. SITE CODES: A. PQA D; B. ACP D; C. FOB D
15. NOUN: SUPPORT
16. SVC/AGENCY USE
17. PR/MIPR DATA: FY7624-86-01606
18. AUTHORIZED RATE: A. PROGRESS PAY %; B. RECOUP %
19. CONTRACT PERCENT FEE %
20. SVC ID NO.
21. ITEM/PROJ MGR: FY7624
22. 1ST DISCOUNT A. %; B. DAYS
23. 2ND DISCOUNT A. %; B. DAYS
24. 3RD DISCOUNT A. %; B. DAYS
25. NET DAYS
26. QUANTITY VARIANCE A. OVER %; B. UNDER %
27. TYPE CONTRACT
28. OPR
29. DESCRIPTIVE DATA

PROVIDE SUPPORT IN ACCORDANCE WITH THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT.

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.
N = NOT APPLICABLE
U = UNDEFINITIZED
NSP = NOT SEPARATELY PRICED
E = ESTIMATED
− (IN QTY AND $) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT REQMT
SITE CODES: S = SOURCE; D = DESTINATION; O = INTERMEDIATE

PART I SECTION B OF THE SCHEDULE
SUPPLIES LINE ITEM DATA

1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3.
F33615-85-D-4535	0002	PAGE 3 OF 22

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*
0004	1	LO	$ N	$ N

9. SCTY CLAS	10. ACRN	11. NSN	12. FSCM AND PART NUMBER	13. CIRR
U	AA	N		

14. SITE CODES A. PQA	B. ACP	C. FOB	15. NOUN	16. SVC/AGENCY USE
D	D	D	CHEM ANALYSIS AND DATA	

17. PR/MIPR DATA	18. AUTHORIZED RATE A. PROGRESS PAY	B. RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR
FY7624-86-01606	%	%	%		FY7624

22. 1ST DISCOUNT A.	B. DAYS	23. 2ND DISCOUNT A.	B. DAYS	24. 3RD DISCOUNT A.	B. DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER	B. UNDER	27. TYPE CONTRACT	28. OPR
%		%		%			%	%		

29. DESCRIPTIVE DATA

PERFORM CHEMICAL TESTS IAW THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT. SUBMIT DATA IAW ATTACHMENT# 1 , THE CONTRACT DATA REQUIREMENTS LIST OF THE BASIC CONTRACT, AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION.

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*
			$	$

9. SCTY CLAS	10. ACRN	11. NSN	12. FSCM AND PART NUMBER	13. CIRR

14. SITE CODES A. PQA	B. ACP	C. FOB	15. NOUN	16. SVC/AGENCY USE

17. PR/MIPR DATA	18. AUTHORIZED RATE A. PROGRESS PAY	B. RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR
	%	%	%		

22. 1ST DISCOUNT A.	B. DAYS	23. 2ND DISCOUNT A.	B. DAYS	24. 3RD DISCOUNT A.	B. DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER	B. UNDER	27. TYPE CONTRACT	28. OPR
%		%		%			%	%		

29. DESCRIPTIVE DATA

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.
N = NOT APPLICABLE
U = UNDEFINITIZED
NSP = NOT SEPARATELY PRICED
E = ESTIMATED
− (IN QTY AND $) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT REQMT
SITE CODES: S = SOURCE, D = DESTINATION, O = INTERMEDIATE

INSTALLATION RESTORATION PROGRAM
PHASE II - CONFIRMATION/QUANTIFICATION (STAGE 2)
MOODY AFB, GA

I. DESCRIPTION OF WORK

The overall objective of the Installation Restoration Program (IRP) Phase II investigation is to assess potential contamination at past hazardous waste disposal and spill sites on Air Force installations. A series of staged field investigations may be required to meet this objective.

The intention of this staged investigation is to undertake a field and laboratory study at Moody AFB, GA to: (1) confirm the presence or absence of contamination within the specified areas of investigation, (2) if possible, determine the extent, degree of contamination, and the potential for migration of those contaminants in the environment, (3) identify public health and environmental hazards of stationary or migrating pollutants based on state or federal standards for those contaminants, and (4) delineate additional investigations required beyond this stage to reach the objectives of Phase II.

Sites 2 and 3 as listed in paragraph I.H. are new to this investigation. Sites 1 and 4 require additional investigation as a result of the IRP Phase II Stage 1 effort at Moody AFB, GA.

The IRP Phase I Report and Phase II Stage 1 Report (mailed under separate cover) incorporate the background and description of the sites for this task. To accomplish this survey effort, the contractor shall take the following actions:

A. General Requirements

1. Conduct a literature search of local hydrogeological conditions to complement the Phase I and Phase II Reports (mailed under separate cover). Include the pertinent literature search information in an appendix to the Final Report. Develop the literature search data using literature search information in an appendix to the Final Report. Develop the literature search data using the following guidelines:

a. Topographic data

b. Geologic data

(1) Structure

(2) Stratigraphy

(3) Lithology

c. Hydrogeologic data

(1) Location of all existing and abandoned wells, observation wells, springs, ponds (natural and artificial) and seepages that occur on or off the installation within a one-mile radius of the sites to be investigated.

(2) Groundwater table and piezometric contours

(3) Depth to groundwater

(4) Surface and groundwater quality

(5) Delineated areas of recharge, discharge and contributing areas

(6) Geologic setting, yield data, and hydrographs of springs and natural seepages

d. Data on all existing and abandoned wells, including uncased boreholes, on or off the installation within a one-mile radius of the sites to be investigated.

(1) Location, depth, diameter, well type, and lithologic logs associated with the well

(2) Static and pumping water levels, yield, specific capacity, well hydrographs, and related data

(3) Existing and projected groundwater development and use.

(4) Observation and monitoring well networks, pumping influences, barrier and recharge boundaries, and related hydraulic interferences influencing aquifer behavior.

(5) Well and screen corrosion, encrustation, and similar operation and maintenance problems

(6) Existing water sampling sites

e. Aquifer data

(1) Type, (i.e., unconfined, artesian, or perched)

(2) Thickness, depth to aquifer, and formational designation

(3) Barrier and recharge boundaries

(4) Transmissivity, storativity, and permeability (gpd/ft^2)

(5) Specific retention

(6) Delineation of discharge and recharge areas

(7) Ground and surface water relationships

(8) Aquifer models

f. Climatic data

(1) Precipitation (total and net)

(2) Evapotranspiration

2. Determine the areal extent of the sites by reviewing historical and current panchromatic and infrared aerial photography.

B. Technical Operations Plan

Immediately after the Notice To Proceed (NTP) for the delivery order, develop a Technical Operations Plan (TOP) based on the technical requirements specified in this task description (See Sequence No. 19, Item VI below). Follow the TOP format (mailed under separate cover). Provide the TOP to the USAFOEHL within two weeks of the NTP.

C. Health and Safety

Comply with USAF, OSHA, EPA, state and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. Prepare a written Health and Safety Plan for the proposed work effort and coordinate it directly with applicable regulatory agencies prior to commencing field operations. Provide an information copy of the Health and Safety Plan to the USAFOEHL after coordination with regulatory agencies. The Health and Safety Plan is specified in Sequence No. 7, Item VI below.

D. Drilling and Soils Work

1. Determine the exact location of all monitor wells and soil borings during the planning/mobilization phase of the field investigation. Consult with base personnel to minimize disruption of base activities, to properly position wells with respect to exact site locations, and to avoid underground utilities. Direct the drilling and sampling and maintain a detailed log of the conditions and materials penetrated during the course of the work. Do not drill boreholes into or position wells in actual landfill areas; rather, install wells at the landfill perimeter.

2. Monitor the ambient air during all well drilling and soil boring with a photoionization meter or equivalent organic vapor detector to identify the generation of potentially hazardous and/or toxic vapors or gases. Include air monitoring results in the boring logs. If soil encountered during borehole drilling is suspected to be hazardous because of abnormal discoloration, odor or air monitoring levels, containerize the soil cuttings in new, unused drums. Enter into the boring logs the depths(s) from which suspected contaminated soil cuttings were collected for containerization. Collect a maximum of 6 composite samples, one from the contents of each drum. Test each composite sample for EP Toxicity (metals). Use RCRA criteria to determine if soil cuttings must be classified as hazardous waste (40 CFR 261.24).

3. Groundwater Monitoring Wells

a. Installation of Groundwater Monitoring Wells

(1) Comply with U.S. EPA Publication 330/9-S1-002, NEIC Manual for Groundwater/Subsurface Investigations at Hazard Waste Sites, for monitoring well installation.

(2) All well drilling, development, purging, sampling methods, and other activity pertaining to this effort must conform to state and other applicable regulatory agency requirements. Cite references in an appendix to the Final Report.

(3) Install wells at a sufficient depth to collect representative samples of aquifer quality and to intercept contaminants if they are present.

(4) Avoid, when possible, installing wells in depressions or areas subject to frequent flooding and standing water. If wells must be installed in such areas, design the wells such that standing water does not leak into the top of the casing or cascade down the annular space.

(5) Drill all monitoring wells using the following specifications:

(a) Drill wells using hollow-stem auger or wet rotary (potable water only, no drilling muds) techniques. A center stem, plug, and bit attached to the stem may be inserted into the auger for use while drilling. This will prevent material from entering into the hollow stem of the auger. In this study, shallow wells are wells which are less than or equal to thirty feet in depth. Deep wells are wells which are greater than thirty feet in depth.

(b) Take lithologic samples at five-foot intervals and prepare borehole log descriptions. For those boreholes constructed using rotary techniques, E-log the borehole after its completion. Place soil samples in jars and deliver to the base Civil Engineer. Include pilot boring logs and well completion summaries in the Final Report (Item VI, below).

(c) Drill a maximum of 13 wells. Total footage for all wells in this task shall not exceed 630 linear feet. Refer to the site-specific details in Section I.H.

(d) Construct each well with two-inch inside diameter (I.D.) Schedule 80 PVC casing. Use threaded screw-type joints only; glued fittings are not permitted. Flush-thread all connections. Screen each well using two-inch I.D. casing having up to 0.020 inch slots. Slot size may be smaller based upon borehole geology. Screen material must be the same as that of the casing. Cap the bottom of the screen.

(e) Screen all wells so as to collect floating contaminants and to allow for yearly fluctuations of the water table. Screen all wells a minimum of ten feet.

(6) Complete all monitoring wells using the following specifications:

(a) Once the casing is installed, allow the soil formation to collapse around the well screen. Supplement the natural gravel pack with washed and bagged rounded silica sand and gravel with a grain size distribution compatible with the screen and soil formation. Place the pack from the bottom of the borehole to two feet above the top of the screen. Tremie a five foot bentonite seal (granulated or pellets) above the sand/gravel pack. Ensure that the bentonite forms a complete seal. Grout the remainder of the annulus to the land surface with a Type I Portland cement/bentonite slurry.

(b) Check with the base point of contact (POC) to determine whether wells shall be completed flush or projected above the ground surface.

1. If well stick-up is of concern in an area, complete the well flush with the land surface. Cut the casing two to three inches below land surface and install a protective locking lid consisting of a cast-iron valve box assembly. Center the lid assembly in a three foot diameter concrete pad sloped away from the valve box. Ensure that free drainage is maintained within the valve box. Also, provide a screw-type casing cap to prevent infiltration of surface water. Maintain a minimum of one foot clearance between the casing top and the bottom of the valve box. Clearly mark the well number on the valve box lid.

2. If an above-ground surface completion is used, extend the well casing two or three feet above land surface. Provide an end plug or casing cap for each well. Shield the extended casing with a steel guard pipe which is placed over the casing and cap, and seated in a two-foot by two-foot by four-inch concrete surface pad. Slope the pad away from the well sleeve. Install a lockable cap or lid on the guard pipe. Install three, three-inch diameter steel guard posts if the base POC determines the well is in an area which needs such protection. The guard posts shall be five feet in total length and installed radially from each wellhead. Recess the guard posts approximately two feet into the ground. Do not install the guard posts in the concrete pad placed at the well base. Paint the protective steel sleeve and clearly number the well on the sleeve exterior.

3. Provide locks for both flush and above-ground well assemblies. Turn over the lock keys to the base POC following completion of the field effort.

(d) Develop each well as soon as practical after completion with a submersible pump, bailer, and/or airlift method. Continue well development until the discharge water is clear and free of sediment to the fullest extent possible. Measure the rate of water produced, the pH, specific conductance and water temperature during well development and include this information in the final report. Perform a well recovery test and a slug test on each of the twelve new wells drilled during this task. The results of these tests is to be provided in the final report.

(e) Determine, by survey, the elevation of all newly installed monitoring wells to an accuracy of 0.01 foot. Notch the top of the riser casing where well elevations are established. Horizontally locate the new wells to an accuracy of 1.0 foot and record the position on both project and site-specific maps. Bench marks used must have previously been established from and be traceable to a USCGS or USGS survey marker.

(f) Measure water levels at all monitoring wells as feet below the ground surface or below the top of casing elevation to the nearest 0.01 foot. Report as mean sea level (MSL). Measure static water levels in wells prior to well development and before all well purging which precedes sampling events.

b. Recommend well abandonment method(s) or technique(s) which are applicable to the type of monitoring wells installed and the geological conditions. Consider that these wells will be abandoned at some future date after the study objectives have been met and there is no longer a need for the wells. The actual process of well abandonment is not a part of this task order. Insure that the recommended method(s) meets state and/or local well abandonment guidelines or regulations.

c. Complete permits, applications, and other documents which may be required by local and/or state regulatory agencies for the installation of monitoring wells. File these documents with appropriate agencies and pay all permitting and filing fees.

4. Soil Borings

a. Conduct a maximum of ten temporary soil borings and one detailed soil boring not to exceed a total of 220 linear feet. Accomplish the borings using hollow-stem auger or power auger techniques. Drill all holes to two feet below the soil/water interface. Obtain split-spoon samples from the detailed boring using ASTM Method D-1586. Refer to Section I.H. for soil boring and soil sample collection details.

b. Scan all split-spoon soil cores with a photoionization meter or equivalent organic vapor detector. Include monitoring results in the boring logs.

c. During the boring operations, describe lithologies encountered and prepare stratigraphic logs. Place special emphasis on field identification of contaminated soils encountered.

d. Whenever possible, measure water levels in all boreholes after the water level has stabilized. Examine the water surface for the presence of hydrocarbons. Include this information in the boring logs.

e. Tremie-grout all boreholes to the surface with bentonite. It is especially important to insure that they be adequately resealed to preclude future migration of contaminants.

f. Permanently mark each location where soil borings are drilled. Record the location on a project map for each specific site or zone, whichever is applicable.

5. Well and Borehole Cleanup

Remove all well/borehole cuttings and clean the general area following the completion of each well/borehole. Containerize and store cuttings suspected to be contaminated according to paragraph I.D.2. of this task order. Transport these drums to a location within the installation boundary designated by the base POC. The base is responsible for ultimate disposal of contaminated soils using base resources.

E. Decontamination Procedures

1. Decontaminate all sampling equipment, including internal components, prior to use and between samples to avoid cross-contamination. Wash equipment with a laboratory-grade detergent followed by drinking quality water, solvent (methanol or pesticide-grade isopropanol), and distilled water rinses. Allow sufficient time for the solvent to evaporate and the equipment to dry completely before reuse.

2. Dedicate for each well the monofilament line or steel wire used to lower sampling equipment i. ɔ the well. Do not use a line or wire in more than one well. Decontaminate the calibrated water level probe for measuring well volume and water level elevation before use in each well.

3. Thoroughly clean and decontaminate the drilling rig and tools

before initial use and after each borehole completion. As a minimum, steam clean drill bits after each borehole is installed. Drill from the "least" to the "most" contaminated sites, if possible.

F. Field Sampling

1. Strictly comply with the sampling techniques, maximum holding times, and sample preservation as specified in the following references: Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985), pages 37-44; ASTM, Section 11, Water and Environmental Technology; Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 2nd Edition (USEPA, 1984); Methods for Chemical analysis of Waters and Wastes, EPA Manual 600/4-79-020, pages xiii to xix (1983); and the Handbook for Sampling and Sample Preservation of Water and Wastewater, EPA Document 600/4- 82-029 (1982).

2. Groundwater Monitoring Wells

a. After development, allow wells to stabilize for a minimum of 1 day before sampling.

b. Prior to purging the wells, examine the surface of the water table for the presence of hydrocarbons and take water level measurements to the nearest 0.01 foot with respect to the established survey point on top of the well casing. If applicable, measure the thickness of the hydrocarbon layer.

c. Purge the well using a submersible pump, bailer, or other acceptable method. Purge until a minimum of three well volumes (based on borehole diameter) of water has been displaced and the pH, temperature, specific conductance, color, and odor of the discharge have stabilized using the following criteria: pH$\pm$0.1 unit, temperature$\pm$0.5C, and specific conductance$\pm$10 mhos. Include the final measurements in the Results section of the report.

d. Collect water samples with a Teflon bailer. However, to collect representative aquifer samples where floating hydrocarbons are present, use a "thief sampler" or similar device to minimize the influence of the free product.

e. If the well(s) cannot be sampled due to well development, well characteristics, or other reason(s), indicate the reason(s) in the report as specified in Item VI below.

f. Remeasure water levels after sampling and after the water conditions in the wells have stabilized.

3. For surface water/sediment samples, collect one surface water and one sediment sample at each sample location specified. Collect samples so as not to cause cross-contamination; obtain downstream samples first, and obtain the water sample at each location before the sediment sample. Measure, on-site, pH, temperature, and specific conductance for all water samples. Permanently mark the location where surface water or sediment samples are collected. Record the location on a project map for each specific site, whichever is applicable.

4. Split all water and soil samples. Analyze one set and immediately deliver the other set (the same collection day) to the base POC. The base POC will select 10% of the split samples, package the

selections with appropriate forms, and deliver them to the contractor within 24 hours of receipt. Supply all packing and shipping materials to the base POC for packaging the split samples. Immediately ship (within 24 hours) the POC-selected samples through overnight delivery to:

USAFOEHL/SA
Bldg 140
Brooks AFB TX 78235-5501

For all split samples sent to the USAFOEHL, complete an AF Form 2752A "Environmental Sampling Data" and/or an AF Form 2752B "Environmental Sampling Data - Trace Organics", (working copies will be provided under separate cover) with the following information:

a. Date and time collected

b. Purpose of sample (analyte and sample group)

c. Installation name (base)

d. Sample number

e. Source/location and depth of sample

f. Contract Task Numbers and Title of Project

g. Method of collection (bailer, suction pump, air-lift pump, etc.)

h. Volumes removed before sample taken (well samples only)

i. Special conditions (use of surrogate standard, etc.)

j. Preservatives used

k. Collector's name or initials

In addition, label each sample container with a permanent ink pen (water-proof laundry marker) to reflect the data in a, b, c, d, j and k above.

5. For every 10 field samples collected, take at least one additional sample (a field duplicate) for quality control purposes. Table 1 provides a 10% allowance for these additional analyses. Duplicates shall be indistinguishable from other analytical samples so that personnel performing the analyses are not able to determine which samples are duplicates.

6. For every 20 field water samples collected, prepare and submit for analysis one field blank for all parameters analyzed in water. A minimum of one field blank for each parameter is required. Allowances for these additional analyses are included in Table 1.

7. Maintain chain-of-custody records for all samples, field blanks, and quality control samples.

G. Chemical Analyses

1. Analyze water and soil samples collected as specified in

Section H below. The analytical parameters are summarized in Table 2 along with the required methods.

2. All analyses shall meet the required limits of detection for the applicable EPA method identified in Table 2.

3. For those methods which employ gas chromatography (GC) as the analytical technique (E601, SW8010 and SW8020) positive confirmation of identity is required for all analytes having concentrations higher than the Method Detection Limit (MDL). Conduct positive confirmation by second-column GC; however, gas chromatography/mass spectroscopy (GC/MS) can be used for positive confirmation if the quantity of each analyte to be confirmed is above the detection level of the GC/MS instrument. Analytes which cannot be confirmed will be reported as "Not Detected" in the body of the report, but results of all second-column GC or GC/MS confirmational analyses are to be included in the report appendix along with other raw analytical data. Base the quantification of confirmed analytes on the first-column analysis. The maximum number of second-column confirmational analyses shall not exceed fifty percent (50%) of the actual number of field samples (to include duplicates). The number of samples for each GC method listed in Table 1 includes this allowance. If GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.

4. All chemical/physical analyses shall conform to state and other applicable Federal and local regulatory agency legal requirements. If a regulatory agency specifies that a type of analysis be performed in a certified laboratory, assure compliance with the requirement and furnish documentation showing laboratory certification with the first analytical data supplied to the USAFOEHL/TS.

5. Archive all raw data, including QA/QC and standards data, for not less than five years after project completion. Supply these data to the USAFOEHL/TS upon request.

H. Specific Site Work

Sites 2 and 3 are new to this investigation. Sites 1 and 4 require additional investigation as a result of the IRP Phase II Stage 1 effort at Moody AFB, GA.

In addition to items delineated in I.A. through I.G. above, conduct the following specific actions at the sites listed below:

1. Southwest Landfill

a. Drill and install a maximum of six shallow and three deep monitor wells. Place five shallow wells around the site perimeter in the determined downgradient direction of groundwater flow. To collect ambient water quality information, place the sixth shallow well outside the site perimeter in the determined upgradient direction of groundwater flow. Place three deep wells outside the site perimeter in the determined downgradient direction of groundwater flow to characterize any vertical migration of contaminants. Shallow monitor wells have an expected average depth of thirty feet per well. Ensure that shallow wells are screened a minimum of ten feet into the aquifer. Deep monitor wells are to be drilled to a maximum depth of 100 feet or until the clay confining layer below the water table aquifer is reached, whichever occurs first. Couple each deep

well with a shallow well. One deep well is to be coupled with existing monitor well L-3.

b. Obtain one water sample from each of the nine new wells and from each of three existing monitor wells (L-1, L-2, L-3) drilled during Stage 1. Also obtain one water sample from Moody AFB Supply Well 7 (MAFB-7). A total of thirteen groundwater samples are required at this site.

c. Analyze all water samples for halogenated volatile organics, aromatic volatile organics, arsenic (As), and mercury (Hg), antimony (Sb), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), zinc (Zn), petroleum hydrocarbons, extractable priority pollutants, and filterable residue (total dissolved solids). See Table 1.

2. Underground Waste Fuel Storage Area

a. Drill a maximum of ten temporary soil borings in and around this area. Monitor and log the boreholes with an OVM to determine the areal extent of contaminants.

b. Based on physical evidence of JP-4 contamination from the ten temporary boreholes, locate and drill one detailed soil boring in the area of the greatest suspected contamination. Analyze a maximum of 4 soil samples from this detailed boring.

c. Combined depth of the eleven boreholes shall not exceed 220 feet.

d. Based on groundwater flow direction determined from the ten temporary boreholes, locate, drill and install a maximum of four shallow monitor wells. Place three of the wells at the site perimeter in the determined downgradient direction of groundwater flow. Place one shallow monitor well in the upgradient direction of groundwater flow.

e. Obtain one water sample from each of the four monitor wells.

f. Analyze all water and soil samples for petroleum hydrocarbons and aromatic volatile organics. See Table 1.

3. Flightline Storm Drain Outfall

a. Collect five surface water and five bottom sediment samples at this site. Locations of the sediment and water samples shall be determined in the field based on visual extent of contamination. Site preparation (clearing of vegetation) shall be performed by the contractor as needed to obtain the required samples.

b. Analyze all sediment and water samples for petroleum hydrocarbons, halogenated volatile organics, aromatic volatile organics, and lead (Pb). See Table 1.

4. Moody AFB Supply Well 10 (at Grassy Pond Annex)

a. Obtain one groundwater sample from Moody AFB Supply Well 10 (MAFB-10).

b. Analyze the water sample for halogenated volatile organics and aromatic volatile organics. See Table 1.

I. Data Review

1. Tabulate field and analytical laboratory results, including field and laboratory parameters and QA/QC data, as they become available and incorporate them into the next monthly R&D Status Report (Sequence No.1, Item VI below) forwarded to the USAFOEHL. In addition to the results, report the following:

a. the time and dates of sample collection, extraction (if applicable) and analysis;

b. the method used and Method Detection Limits achieved;

c. the chain-of-custody forms;

d. a cross-reference of laboratory sample numbers and field sample numbers

e. a cross-reference of field sample numbers to wells, boreholes, sites, etc.

2. Upon completeion of all analyses, tabulate and incorporate all results into an Informal Technical Information Report (Sequence No. 3, Item VI below) and forward the report to USAFOEHL for review a minimum of two weeks prior to submission of the draft report. Provide, as a minimum, the information specified in I.I.1 above.

3. Immediately report to the USAFOEHL Program Manager or his supervisor via telephone the data/results generated during this investigation which indicate a potential health risk (for example, a contaminated drinking water aquifer). Follow the telephone notification with a written notice within three days and attach a copy of the laboratory raw data (e.g., chromatogram).

J. Reporting

1. Prepare a draft report delineating all findings of this field investigation and forward it to the USAFOEHL (as specified in Sequence No. 4, Item VI below) for Air Force review and comment. Strictly adhere to the USAFOEHL report format (mailed under separate cover). The format is an integral part of this delivery order. Draft reports are considered "drafts" only in the sense that they have not been reviewed and approved by Air Force officials. In all other respects, "drafts" must be complete, in the proper format, and free of grammatical and typographical errors. Include as a minimum, discussion of the regional/site-specific hydrogeology, well and boring logs, data from water level surveys, water table configuration and/or piezometric contour maps, water quality and soil analysis results, hydrogeological cross sections, and laboratory and field QA/QC information. For states that require the field work or technical effort to be supervised by a State-registered geologist, engineering geologist or professional engineer; insert this information into the report and include registration numbers, certificates and seals (as appropriate).

2. Review the Results, Conclusions and Recommendations concerning

the sites listed in this task which were investigated during a previous IRP Phase II stage work effort. Use this information and data from previous efforts to establish trends and develop conclusions and recommendations. Integrate all investigative work done at each site to date so the report reflects the total cumulative information for each site studied in this effort.

3. In the Results section, include water and soil analytical results and field quality control sample data. Report all internal laboratory quality control data (lab blanks, lab spikes and lab duplicates) and laboratory quality assurance information in an appendix of the report. Also provide second-column confirmation results and quantities, and include which columns were used, instrument operation conditions, and retention times. Summarize in the appendix the specific collection technique, analytical method (Standard Methods, EPA, etc.), holding time, and limit of detection for each analyte.

4. Make estimates of the magnitude, extent, direction, and velocity in which detected contaminants are moving. Identify potential environmental consequences of the discovered contaminants based upon State or Federal standards.

5. Plot and map all field data collected for each site according to surveyed positions.

6. In the Recommendation section, address each site and list them by category:

a. Category I consists of sites where no further action (including remedial action) is required. Data for these sites are considered sufficient to rule out unacceptable public health or environmental hazards.

b. Category II sites are those requiring an additional Phase II effort to determine the direction, magnitude, rate of movement and extent of detected contaminants. Identify potential environmental consequences of discovered contamination.

c. Category III sites are those that will require remedial action (ready for IRP Phase IV). In the recommendations for Category III sites, include any possible influence on sites in Categories I and/or II due to their connection with the same hydrological system. Clearly state any dependency between sites in different categories. Include a list of possible remedial action alternatives, including long-term montoring (LTM) as a remedial action, and the corresponding rationale that should be considered in selecting the remedial action for a given site. Included here should be recommendations on wells to be abandoned and/or sealed, if appropriate. List all alternatives that could potentially bring the site into compliance with environmental standards. For contaminants that do not have standards, EPA-recommended safe levels for noncarcinogens (Health Advisory or Suggested-No-Adverse-Response Levels) and target levels for carcinogens (1×10^{-6} cancer risk level) may be used. Unless specifically requested, do not perform any cost analyses or cost/benefit review for remedial action alternatives. However, in those situations where field survey data indicate immediate corrective action is necessary, present specific, detailed recommendations.

7. For each category above, summarize the results of field data, environmental or regulatory criteria, or other pertinent information

supporting conclusions and recommendations. Reduce this summary information into a table (or tables) which will be included in the text and the Executive Summary.

8. Provide cost estimates by line item for future efforts recommended for Category II sites and LTM Category III sites. Submit these estimates concurrently with the approved final technical report in a separate document. Only the cost requirements outlined in Sequence No. 2, Item VI, need be submitted.

a. For Category II sites, develop detailed site-specific estimates using prioritized costing format (i.e., cost of conducting the required work on: the highest priority site only, the first two highest priority sites only, the first three highest priority sites only, etc., until all required work is discretely costed) for the proposed work effort. The Air Force determines the priority of sites from the contractor's recommendations. Consider the type of contaminants, their magnitude, the direction and rate of their migration, and their subsequent potential for environmental and health consequences when developing recommendations for site prioritization.

b. For Category III sites slated for long-term monitoring, develop site-specific estimates which detail the costs associated with: (1) permanent installation of monitoring wells, (2) ground water sampling interface equipment, including permanent installation of pumps and sampling lines (i.e., dedicated equipment), and (3) four quarterly (1 year period) sample collections and laboratory chemical analyses of groundwater, etc.

9. Provide an inventory of all on-base wells, including well type identification (i.e., production well, monitoring well, etc.). If the well has been abandoned, note the reason, and identify those wells which have been permanently plugged or sealed.

10. Reference in an appendix any local, state and/or Federal regulations which require specific well drilling techniques, materials, well development, purging, and sampling methods as specified in this work effort.

K. Meetings

The contractor's project leader shall attend 3 meeting(s) to take place at a time to be specified by the USAFOEHL. Each meeting shall take place at Moody AFB, GA for a duration of approximately eight hours.

II. SITE LOCATION AND DATES:

Moody AFB, GA

Date to be established

III. BASE SUPPORT:

A. Prior to any contractor digging or drilling, the Base Civil Engineer will locate underground utilities and issue digging or other appropriate permits.

B. The Base Civil Engineer will assign accumulation points within the installation for the contractor to use to deliver any drill cuttings or well installation/development fluids generated from the required work which are

suspected to be hazardous.

C. The Base Civil Engineer will take custody of any drill cuttings or well installation/development fluids suspected to be hazardous and properly dispose of the material according to applicable state and/or Federal regulations.

D. The base will provide the contractor with existing engineering plans, drawings, diagrams, aerial photographs, etc., to evaluate sites under investigation.

E. The Base will arrange for, and have available prior to the start-up of field work, the following services, materials, work space, and items of equipment to support the contractor conducting the survey:

1. Personnel identification badges, vehicle passes and/or entry permits.

2. A secure staging area for storing equipment and supplies.

3. A supply (i.e., fire hydrant) of large quantities (up to a maximum of 1,000 gallons) of potable water for borehole flushing, equipment cleaning, etc.

4. A paved area where drilling equipment can be cleaned and decontaminated. A source of potable water (i.e., ordinary outdoor water faucet) and a 110/115 VAC electrical outlet must be available within 25 feet of the paved area for steam cleaner hookup. Drainage from this paved area should be through an oil/water separator to a sanitary sewer.

5. A temporary office area, not to exceed 100 square feet, and equipped with a Class A telephone for local and long distance telephone calls. The contractor shall pay for any long distance telephone calls made by his personnel from this phone.

6. A household-type refrigerator having at least two cubic feet of freezer space.

7. A set of keys to existing monitoring well locks. The contractor shall return the keys to the base when the survey has been completed (not necessary if combination locks are used as an alternative).

IV. GOVERNMENT FURNISHED PROPERTY: None

V. GOVERNMENT POINTS OF CONTACT:

1. USAFOEHL
Technical Program Manager
2Lt Gary L. Woodrum
USAFOEHL/TSS
Brooks AFB TX 78235-5501
(512) 536-2158
AUTOVON 240-2158/2159
1-800-821-4528

2. Base Point of Contact (POC)
2Lt Lana Harvey
USAF Hospital Moody/SGPB
Moody AFB, GA 31699-5000
(912) 333-3505
AUTOVON 460-3505

3. MAJCOM Monitor
Col Jerry Dougherty
HQ TAC/SGPB
Langley AFB, VA 23665

4. Base Civil Engineer POC
Carlton Crenshaw
347 CSG/DEEV
Moody AFB, GA 31699-5000

(804) 764-5857/3332 AUTOVON 432-5857/3332

(912) 333-4654 AUTOVON 460-4654

VI. In addition to sequence numbers 1, 5 and 11 listed in Attachment 1 to the contract, and which apply to all orders, the sequence numbers listed below are applicable to this order. Also shown are dates applicable to this order.

Sequence No.	Para No.	Block 10	Block 11	Block 12	Block 13	Block 14
19(TOP)*	I.B.	OTIME	86 OCT 10	86 OCT 13		15
7 (Health & Safety)	I.C.	OTIME	86 OCT 10	86 OCT 13		3
3 (Prelim. Data)	I.I.2	OTIME	**	**		3
4 (Tech. Rpt)	I.J.	ONE/R	86 DEC 31	87 FEB 6	87 NOV 6	***
2 (cost data)	I.J.8.	OTIME	87 FEB 6	87 NOV 6		****
14		MONTHLY	86 OCT 27	86 NOV 14	*****	3
15		MONTHLY	86 OCT 27	86 NOV 14	*****	3

*The Technical Operations Plans (TOP) required for this stage is due within two weeks of the Notice to Proceed.

**Upon completion of the total analytical effort and before submission of the first draft report.

***Two draft reports (25 copies of each) and one final report (50 copies plus the original camera-ready copy) are required. Incorporate Air Force comments into the second draft and final reports as specified by the USAFOEHL. Supply the USAFOEHL with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Print and distribute the remaining 24 copies of each draft report and 49 copies of the final report as specified by the USAFOEHL.

****Submit cost estimates (five copies) in a separately bound document with the Final Report only. Provide estimates for only those sites recommended for additional Phase II work (Category II) and Phase IV, Long Term Monitoring, (Category III).

*****Submit monthly hereafter.

TABLE 1

SAMPLING AND ANALYTICAL REQUIREMENTS
MOODY AFB, GA

Analyte	Medium	Site Numbers 1	2	3	4	QC(1)	Second Column Confirmation	Total
Halogenated Volatile Organics	Water	13		5	1	3	11	33
	Soil			5		1	3	9
Aromatic Volatile Organics	Water	13	4	5	1	3	13	39
	Soil		4	5		1	5	15
Extractable Priority Pollutants	Water	13				2		15
Petroleum Hydrocarbons	Water	13	4	5		3		25
	Soil		4	5		1		10
Priority (2) Pollutant Metals	Water	13				2		15
Selenium	Water	13				2		15
Arsenic	Water	13				2		15
Lead	Water			5		2		7
	Soil			5		1		6
Mercury	Water	13				2		15
Filterable Residue	Water	13				2		15
EP Toxicity Metals	Soil Cuttings	6 Samples authorized as needed-not specified by site						6

(1) Ten field blanks as specified in paragraph I.F.6. of this SOW are included in the QC column of this table.

(2) See Table 2 for specific metals.

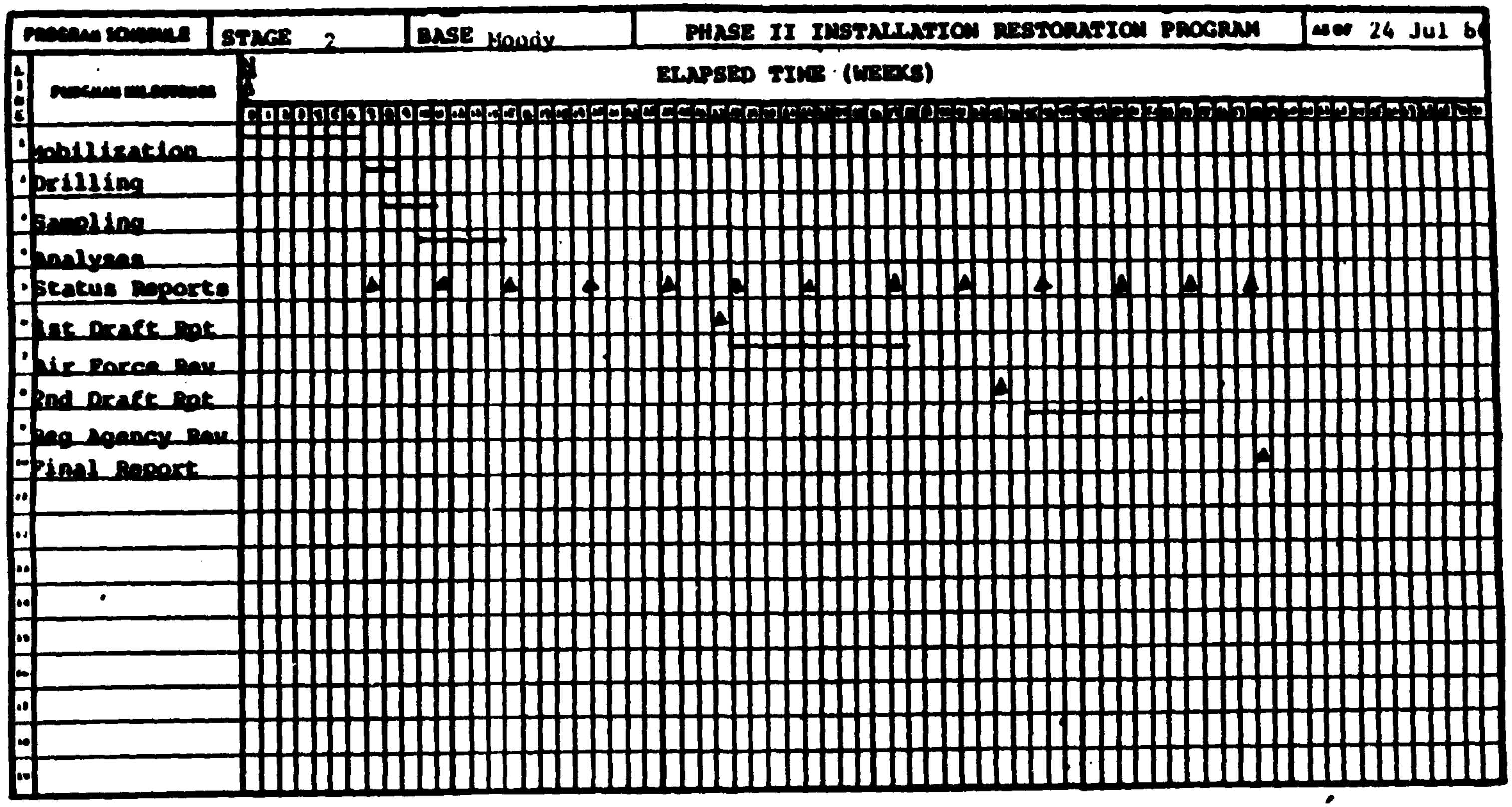
TABLE 2

ANALYTICAL PARAMETERS, METHODS, AND DETECTION LIMITS

Parameter	Medium	Method	Detection Limit
Halogenated Volatile Organics	Water	E601	a
	Soil	SW5030/SW8010	a
Aromatic Volatile Organics	Water	SW5030/SW8020	a
	Soil	SW5030/SW8020	a
Extractable Priority Pollutants	Water	E625	a
Petroleum Hydrocarbons	Water	E418.1	1 mg/L
	Soil	SW3550/E418.1	1 mg/kg
Priority Pollutant Metals:	Water	E200.7	mg/L:
Sb			0.053
Be			0.0003
Cd			0.004
Cr			0.007
Cu			0.006
Pb			0.042
Ni			0.015
Ag			0.007
Tl			0.040
Zn			0.002
Selenium	Water	E270.2	0.002 mg/L
Arsenic	Water	E206.2	0.001 mg/L
Lead	Water	E239.2	0.002 mg/L
	Soil	SW3010/SW7420	50 mg/kg
Mercury	Water	E245.1	0.0002 mg/L
Filterable Residue	Water	E160.1	10 mg/L
EP Toxicity Metals:	Soil Cuttings	40 CFR Subpart C., 261.24	mg/L: b
As			0.053
Ba			0.1
Cd			0.005
Cr			0.05
Pb			0.1
Hg			0.0002
Se			0.075
Ag			0.01

a Use parameters and detection limits as specified in the method.

b Detection limits for EP Toxicity Metals are based on the flame AA and ICP methods.



NOTE: This schedule is for illustrative purposes only. For contractual schedule requirements, refer to Para VI of the Task Description and Section F on Page 22 hereof.

PART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN): F33615-85-D-4535
2. SPIIN: 0002
3. PAGE 22 OF 22

4. ITEM NO.: 0001 | 5. ACRN: AA | 6. TSP PRI | 7. MILSTRIP DOC NO. AND SUFFIX | 8. CON ITEM SERIAL NO. | 9. ENDING SERIAL NO. (WHEN APPL) | 10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88FEB15	A.	A. 1	U	FY7624	
B.	B.	B.			
C.	C.	C.			

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
D.	D.	D.
E.	E.	E.

17. DESCRIPTIVE DATA

A. SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.

B. TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.
C. ALL DATA SHALL BE DELIVERED IAW ATTACHMENT# 1 OF THE BASIC CONTRACT AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 87NOV06.
D. THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A

4. ITEM NO.: 0002 | 5. ACRN: AA | 6. TSP PRI | 7. MILSTRIP DOC NO. AND SUFFIX | 8. CON ITEM SERIAL NO. | 9. ENDING SERIAL NO. (WHEN APPL) | 10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88FEB15	A.	A. 1	U	FY7624	
B.	B.	B.			
C.	C.	C.			

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
D.	D.	D.
E.	E.	E.

17. DESCRIPTIVE DATA

A. SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.

3. TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.

4. ITEM NO.: 0004 | 5. ACRN: AA | 6. TSP PRI | 7. MILSTRIP DOC NO. AND SUFFIX | 8. CON ITEM SERIAL NO. | 9. ENDING SERIAL NO. (WHEN APPL) | 10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88FEB15	A.	A. 1	U	FY7624	
B.	B.	B.			
C.	C.	C.			

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
D.	D.	C.
E.	E.	E.

17. DESCRIPTIVE DATA

A. SEE SECTION H OF THE BASIC CONTRACT FOR FY7524 ADDRESS.

B. TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.
C. ALL CHEMICAL ANALYSIS DATA SHALL BE DELIVERED IAW ATTACHMENT# 1 AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 87NOV06.
D. THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A

*REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR − APPEARS AFTER THE ITEM NO.
E = ESTIMATED
− (IN QTY) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION

CONTRACTOR'S COPY

REF 68X (1g)

68X

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. PAGE 1 OF 3

2. PROC INSTRUMENT ID NO. (PIIN): F33615-85-D-4535
3. SPIIN: 000201
4. EFFECTIVE DATE: MAIL DATE
5. REQUISITION/PURCHASE REQUEST PROJECT NO.
6. DOC/DMS RATING

7. ISSUED BY — CODE FQ8419
DEPARTMENT OF THE AIR FORCE
AIR FORCE SYSTEMS COMMAND
AERONAUTICAL SYSTEMS DIV/PMRSC
WRIGHT-PATTERSON AFB, OH 45433-6503
NEGOTIATOR: VICKY J. WILLIAMS
PHONE: (513) 255-5911

8. ADMINISTERED BY (IF OTHER THAN BLOCK 7) — CODE S1002A
DCASMA ORLANDO
3555 MAGUIRE BLVD.
ORLANDO FL 32803-3726

9. CONTRACTOR NAME AND ADDRESS — CODE 2T460 — FACILITY CODE
CH2M HILL SOUTHEAST, INC.
7201 N.W. 11TH PLACE
P.O. BOX 1647
GAINESVILLE FL 32602
COUNTY: ALACHUA
PHONE: (904) 377-2442

MAILING DATE
NOV 30 1987
DUPLICATE ORIGINAL

10. SECURITY CLAS

11. DISCOUNT FOR PROMPT PAYMENT
1ST % DAYS — NET DAYS
2ND % DAYS — OTHER (IF "9" SEE SECT "E")
3RD % DAYS

12. PURCHASE OFFICE POINT OF CONTACT: LQQ/LP3/LQO

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended by one of the following methods:

(a) By signing and returning ______ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO ______ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ______ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

X THIS MODIFICATION IS ISSUED PURSUANT TO THE "ORDERING" CLAUSE OF THE CONTRACT CLAUSES

15. CONTRACT ADMINISTRATION DATA

A. KIND OF MOD	B. MOD ABST RECIPIENT ADR BY	C. DATE OF SIGNATURE MODIFICATION	D. CHANGE IN CONTRACT AMOUNT INCREASE (+) DECREASE (-)	E. LOSING PO CAO ON TRANSFER	F. GAINING PO/CAO ON TRANSFER	G. SVC/AGENCY USE
B			$			

16. ENTER ANY APPLICABLE CHANGES

A. PAY CODE — B. EFFECTIVE DATE OF AWARD — C. CONTRACT (1) TYPE (2) KIND — D. TYPE CONTR — E. S.B.P. CR — F. SPL CONTR PROVISIONS — G. PAYING OFC CODE — H. DATE SIGNED — I. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)

SUBJECT: PERIOD OF PERFORMANCE REVISION
PROJECT ENGINEER: EMILE BALADI, USAFOEHL/TS, BROOKS AFB TX 78235-5501
FINANCE OFFICE: DCASR ATLANTA, 805 WALKER ST., MARIETTA GA 30060-2789 (S1102A)

X CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT

☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ______ COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)
BY

22. UNITED STATES OF AMERICA (Signature of Contracting Officer)
BY Barbara A. Mumma

20. NAME AND TITLE OF SIGNER (Type or print)

21. DATE SIGNED

23. NAME OF CONTRACTING OFFICER (Type or print): BARBARA A. MUMMA

24. DATE SIGNED: 24 NOV 1987

SCHEDULE OF CHANGES

FIRST: Section F of the Schedule, AFSC Form 706 (70H), is amended as shown on page 3, hereof.

SECOND: Paragraph VI, Sequence 4, Block 13 of the task description is changed from 87 Nov 06 to 88 Feb 11.

THIRD: There will be no increase or decrease in the not-to-exceed delivery order ceiling price.

PART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN): F33615-85-D-4535
2. SPIIN: 000201
3. PAGE 3 OF 3

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0001	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88MAY31	A.	A. 1	U	FY7624	
B.	B.	B.			
C.	C.	C.			

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
D.	D.	D.
E.	E.	E.

17. DESCRIPTIVE DATA
SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.
ALL DATA SHALL BE DELIVERED IAW ATTACHMENT #1 OF THE BASIC CONTRACT AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 88FEB11.
THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0002	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88MAY31	A.	A. 1	U	FY7624	
B.	B.	B.			
C.	C.	C.			

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
D.	D.	D.
E.	E.	E.

17. DESCRIPTIVE DATA
SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.

TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0004	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88MAY31	A.	A. 1	U	FY7624	
B.	B.	B.			
C.	C.	C.			

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
D.	D.	C.
E.	E.	E.

17. DESCRIPTIVE DATA
SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.
ALL CHEMICAL ANALYSIS DATA SHALL BE DELIVERED IAW ATTACHMENT #1 AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 88FEB11.
THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A.

*REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR − APPEARS AFTER THE ITEM NO.
E = ESTIMATED
− (IN QTY) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION

5BX (1g) 06 APR 1988 6BX

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

PAGE 1 OF 3

CONTRACT ID NO. (PIIN)	SPIIN	EFFECTIVE DATE	REQUISITION/PURCHASE REQUEST PROJECT NO.	DPAS RATING
F33615-85-D-4535	000202	88APR20	FY7624-88-01611	

ISSUED BY CODE FQ8419

DEPARTMENT OF THE AIR FORCE
AIR FORCE SYSTEMS COMMAND
AERONAUTICAL SYSTEMS DIV/PMRSC
WRIGHT-PATTERSON AFB, OH 45433-6503
NEGOTIATOR: PATRICE M. HUTSON
PHONE: (513) 255-5911

ADMINISTERED BY (IF OTHER THAN BLOCK 7) CODE S1002A

DCASMA ORLANDO
3555 MAGUIRE BLVD.
ORLANDO FL 32803-3726

CONTRACTOR NAME AND ADDRESS CODE 2T460 FACILITY CODE

CH2M HILL SOUTHEAST, INC.
7201 N.W. 11TH PLACE
P.O. BOX 1647
GAINESVILLE FL 32602
COUNTY: ALACHUA
PHONE: (904) 377-2442

MAILING DATE
MAR 30 1988
DUPLICATE ORIGINAL

10. SECURITY CLAS U

11. DISCOUNT FOR PROMPT PAYMENT

12. PURCHASE OFFICE POINT OF CONTACT
LRX/L67/LRX

13. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 17. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended

14. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS

☐ THIS CHANGE IS ISSUED PURSUANT TO ______ THE CHANGES SET FORTH HEREIN ARE MADE TO THE ABOVE NUMBERED CONTRACT/ORDER.

☐ THE ABOVE NUMBERED CONTRACT IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (SUCH AS CHANGES IN PAYING OFFICE, APPROPRIATION DATA, ETC.) SET FORTH HEREIN.

☐ THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF ______ IT MODIFIES THE ABOVE NUMBERED CONTRACT AS SET FORTH HEREIN.

X THIS MODIFICATION IS ISSUED PURSUANT TO THE "ORDERING" CLAUSE OF THE CONTRACT CLAUSES

15. CONTRACT ADMINISTRATION DATA

a. KIND OF MOD	b. MOD ABST RECIPIENT ADP PT	c. DATE OF SIGNATURE MODIFICATION	d. CHANGE IN CONTRACT AMOUNT INCREASE (+), DECREASE (-)	e. LOSING PO/CAO ON TRANSFER	f. GAINING PO/CAO ON TRANSFER	g. SVC/AGENCY USE
B			$			

16. ENTER ANY APPLICABLE CHANGES

a. PAY CODE · b. EFFECTIVE DATE OF AWARD · c. CONTRACT (1) TYPE (2) KIND · d. TYPE CONTR · e. SURV CRIT · f. SOL CONTR FOR SIZE · g. PAYING OFC CODE · h. DATE SIGNED · i. SECURITY (1) CLAS (2) DATE OF DD 254

17. REMARKS (Except as provided herein, all items and conditions of the contract, as heretofore changed, remain unchanged and in full force and effect.)

SUBJECT: PERIOD OF PERFORMANCE REVISION
PROJECT ENGINEER: EMILE BALADI, USAFOEHL/TS, BROOKS AFB TX 78235-5501
FINANCE OFFICE: DCASR ATLANTA, 805 WALKER ST., MARIETTA GA 30060-2789 (S1102A)

18. [X] CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE

19. CONTRACTOR/OFFEROR (Signature of person authorized to sign)

20. NAME AND TITLE OF SIGNER (Type or print) | 21. DATE SIGNED

22. UNITED STATES OF AMERICA (Signature of Contracting Officer) BY Larry D. Haas

23. NAME OF CONTRACTING OFFICER (Type or print) LARRY D. HAAS | 24. DATE SIGNED 88MAR28

SCHEDULE OF CHANGES

FIRST: Section F of the schedule, AFSC Form 706 (70H), is revised as shown on page 3 herein.

SECOND: This modification will result in no increase or decrease in the not-to-exceed delivery order ceiling price.

THIRD: The contractor's letter, dated 88 Mar 07, showing concurrence with this action is hereby incorporated by reference and made a part hereof.

PART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN) F33615-85-D-4535 | 2. SPIIN 000202 | 3. PAGE 3 OF 3

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0001	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
a. 88DEC01	a.	a. 1	U	FY7624	
b.	b.	b.			
c.	c.	c.			

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.
ALL DATA SHALL BE DELIVERED IAW ATTACHMENT #1 OF THE BASIC CONTRACT AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 88AUG12.
THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0002	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
a. 88DEC01	a.	a. 1	U	FY7624	
b.	b.	b.			
c.	c.	c.			

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
[illegible]HNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
0004	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
a. 88DEC01	a.	a. 1	U	FY7624	
b.	b.	b.			
c.	c.	c.			

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 87FEB06.
ALL CHEMICAL ANALYSIS DATA SHALL BE DELIVERED IAW ATTACHMENT #1 AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 88AUG12.
THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A.

*[illegible] A NET INCREASE/DECREASE WHEN NO + OR – APPEARS AFTER THE ITEM NO.
+ = [illegible]
– (IN QTY) = DECREASE
+ OR – (IN ITEM NO.) = ADDITION OR DELETION

26 APR 1988

PURCHASE REQUEST

(Central Procurement and Research Development Test and Evaluation)

PAGE 1 OF 1 PAGES

1. PROC ACTY	2. TYPE PR	3. PRIORITY	4. DATE PREPARED	5. PURCHASE REQUEST NUMBER	6. AMENDMENT NO
F33615	32	R	88 MARCH 18	FY7624-88-01611	

7. ORGS
USAFOEHL/EMILE BALADI/2158

8. (IF REQUIRED, USE REVERSE SIDE FOR CONTINUATION SHEET)

ITEM NO. A	DESCRIPTION B	PMC C	QUANTITY D	UNIT E	ESTIMATED UNIT PRICE F	EST TOTAL PRICE G
0001	PH II, Installation Restoration Program Stage 1, Moody AFB, GA		1	LO		
0002	SUPPORT per D.C. Lafayette, OEHL, 28 Mar 88 [illegible]		1	LO		
0004	ANALYSES		1	LO		
						9. TOTAL - 0 -

10. ITEM NO. A	DEL DES B	DELIVERY SCHEDULE C	11. SHIP TO A (1)	MARK FOR A (2)	MILSTRIP DATA B
0001	R	88 ~~MAY 31~~ DEC 01 per D.C. Lafayette, OEHL, 28 Mar 88 [illegible]	FY7624	FY7624	
0002	R	88 ~~MAY 31~~ DEC 01	FY7624	FY7624	
0004	R	88 ~~MAY 31~~ DEC 01	FY7624	FY7624	

12. REMARKS

CONTRACT F33615-85-D-4535, ORDER 002, MOD 2 CONTRACTOR: CH2M

NO COST MODIFICATION TO EXISTING ORDER

13. ACCOUNTING CLASSIFICATION

ITEM NO. A	APPROPRIATION (1)	LIMIT SUB NO	FC/Y (2)	OAC/OBAN (3)	OPAC/RDOC (4)	OPC (5)	EEIC (6)	PROG ELEM (7)	ADSN (8)	CPN DEPT (9)
			NO	COST	MODIFI	CATION	TO EX	ISTING	ORDER	

14. APPROVALS

A. PREPARED BY: IRMA I. PEREZ, Procurement Clerk, USAFOEHL 2158	C.	E.
B. [illegible] MORALES, Procurement Assistant, USAFOEHL 2158	D.	F.

Appendix C

WELL AND SAMPLE SITE NUMBERING SYSTEM

1. WELL NUMBERING SYSTEM

SITE 1--SOUTHWEST LANDFILL

All monitoring wells installed at Site 1 are numbered with a three part numbering system. The first part is the prefix L for landfill. The second part is a sequential number starting with the number 7 (previous Phase II, Stage 1 work had installed 6 wells). The third part is the suffix S (for shallow) or D (for deep). Nine new wells were installed during this investigation. These wells are numbered L-7S through L-12S and L-13D through L-15D. The existing wells (all were shallow wells) are numbered L-1 through L-6. Moody AFB Supply Well No. 7 was also sampled as part of the Site 1 effort. The existing number of LSW-7 is used to identify the well in this report.

SITE 2--UNDERGROUND WASTE FUEL STORAGE AREA

Four monitor wells were installed at Site 2 during this investigation. Each of these are numbered using a two part system. The first part is the prefix MU followed by a sequential number. Thus, the four wells are numbered MU-1 through MU-4. Seven temporary well points were also installed at this site. These are referenced in the text as B-1 through B-7. One Standard Penetration Test boring was also conducted at the site and is referenced as SPT boring.

SITE 3--FLIGHT LINE STORM DRAINAGE OUTFALL AREA

No monitoring wells were installed at this site during this investigation. Surface water and sediment samples were collected from five different points within the outfall area. These points are referred to in this report as S-1 through S-5.

SITE 4--MOODY SUPPLY WELL NO. 10, GRASSY POND ANNEX

Moody water supply well number 10 is an existing well located at the Grassy Pond Annex. The existing well number is used to identify the well in this report.

2. SAMPLE NUMBER SYSTEM

A. PROJECT IDENTIFICATION

The first letter in all samples will be an M which will identify that the samples were collected from the Moody AFB.

B. SITE IDENTIFICATION

Individual samples from each site will be differentiated by the second letter in the sample identification as shown below:

L = Landfill (Site 1)
U = Underground Waste Storage Area (Site 2)
F = Flight Line Storm Drain Outfall (Site 3)
G = Grassy Pond Annex (Site 4)

C. SEQUENCE NUMBER

For each site, similar sample types (e.g., wells, sediment samples, etc.) will be assigned sequential numbers starting with the number one.

D. SAMPLE DEPTHS

Deep well identifications (100 feet) will include a "D" for Deep in the sample prefix. Shallow well identifications (30 feet) will include an "S" for Shallow in the sample prefix.

E. SPLIT SAMPLES

The last letter assigned to a given sample identification will include the letter "X" for those samples that will be split for analysis by the OEHL laboratory.

F. EXAMPLES OF SAMPLE NUMBERING

All samples, including the temporary borehole samples, will be assigned unique alpha-numeric identifications. These sample identifications for all samples to be collected are provided below.

Site 1-- Southwest Landfill

Sample Location	Description
ML-1	Existing Shallow Monitoring Well
ML-2	Existing Shallow Monitoring Well
ML-3	Existing Shallow Monitoring Well
ML-7S	New Shallow Monitoring Well
ML-8S	New Shallow Monitoring Well
ML-9S	New Shallow Monitoring Well
ML-10S	New Shallow Monitoring Well
ML-11S	New Shallow Monitoring Well
ML-12S	New Shallow Monitoring Well
ML-13D	New Deep Monitoring Well
ML-14D	New Deep Monitoring Well
ML-15D	New Deep Monitoring Well
MLDC-1	Drum Cuttings For EP Toxicity
MLDC-2	Drum Cuttings For EP Toxicity
MLDC-3	Drum Cuttings For EP Toxicity
MLDC-4	Drum Cuttings For EP Toxicity
MLDC-5	Drum Cuttings For EP Toxicity
MLDC-6	Drum Cuttings For EP Toxicity
MLSW-7	Supply Well No. 7

Site 2--Underground Waste Fuel Storage Area

Sample Location	Description
MUS B-1 (3'-5'), (8'-10'), etc through MUS B-11	Soil boring Samples
MU -1	New Shallow Monitoring Well
MU -2	New Shallow Monitoring Well
MU -3	New Shallow Monitoring Well
MU -4	New Shallow Monitoring Well

Site 3--Flightline Storm Drain Outfall

Sample Location	Description
MFSW-1	Surface Water Sample
MFSW-2	Surface Water Sample
MFSW-3	Surface Water Sample
MFSW-4	Surface Water Sample
MFSW-5	Surface Water Sample
MFSD-1	Sediment Sample
MFSD-2	Sediment Sample
MFSD-3	Sediment Sample
MFSD-4	Sediment Sample
MFSD-5	Sediment Sample

Site 4--Grassy Pond Annex Supply Well

Sample Location	Description
MGSW-10	Supply Well No. 10

Appendix D

WELL COMPLETION REPORTS, BORING LOGS, AND FIELD DATA FROM PHASE II, STAGE 2

Page ___ of ___

CH2M HILL WELL DRILLING REPORT

PROJECT NO. GN21222.CO.04

WELL: L-7S

LOCATION: Moody AFB, Valdosta,GA Landfill

COUNTY: ______ STATE: GA

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 225.67 NGVD

DATE: 1-12-87

(1) CASING: 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/23/86

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______ gp

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

(3) 20-30 Mesh Silica Sand

(4) Bentonite Pellets

(5) ASTM Type I Cement

(6) Protective Vault

(7) Locking Cap

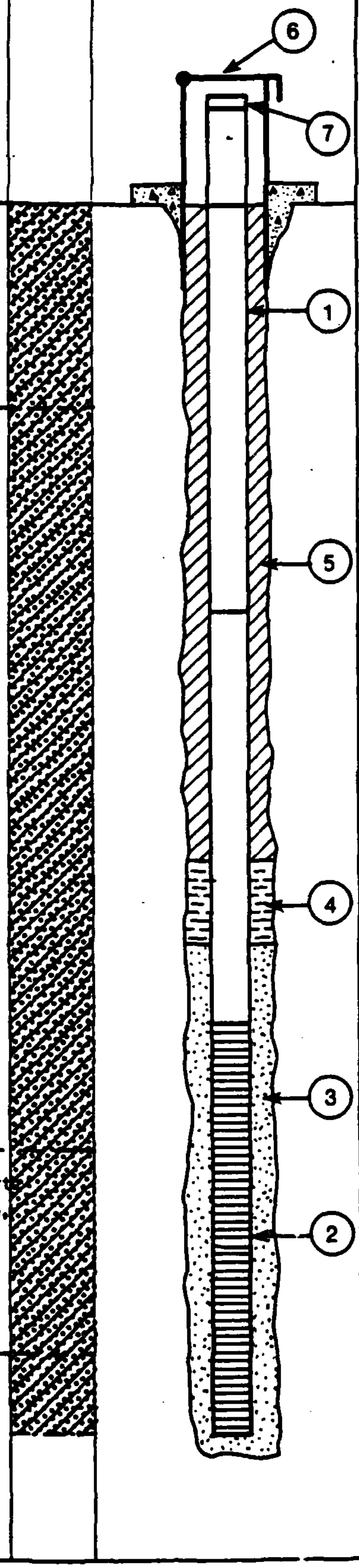
COMPILED BY B. Painter (EWM)

DATE 11-21-86

[1] AS $CaCO_3$

DEPTH	CLASSIFICATION
0–5	Moderate yellowish brown 10 YR 5/4 quartz fine sandy clay, dense, stiff, dry.
5–23	Light gray N8 and dusky red 5 R 3/4, interbedded clayey (kaolin) quartz very fine sand, dense stiff, dry.
23–28	White N9, clayey (kaolin), quartz medium to fine sand, very dense, stiff, hard.
28–30	Light gray N8, clayey (kaolin), quartz med to fine sand, mod. plastic, saturated.

LOG / CONSTRUCTION



FORM 381

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	L-7S	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ________ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE ________ START 11/23/86 FINISH 11/23/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								Organic Vapor Head Space in ppm Benzene Equivalents BKG. SAMPLER
		3-5	SS 1	18"	3-4-6-9	Moderate yellowish brown 10 YR 5/4, quartz fine sandy clay, dense, stiff, dry		0.2 0.2
	5							
		8-10	SS 2	18"	5-13-15-17	Light gray N8 and dusky red 5 R 3/4, interbedded clayey (Kaolin) quartz very fine sand, dense, stiff, dry		0.2 3.8
	10							
		13-15	SS 3	18"	3-4-6-10	As above		0.2 0.2
	15							
		18-20	SS 4	18"	2-5-8-13	As above		
	20							
		23-25	SS 5	18"	4-14-25-47	White N9, Clayey (Kaolin) quartz medium to fine sand, very dense, stiff, hard		
	25							
		28-30	SS 6	18"	2-7-5-4	Light gray N8, Clayey (Kaolin) quartz medium to fine sand, moderately plastic, saturated		
	30							

Page ___ of ___

WELL DRILLING REPORT

CH2M HILL

PROJECT NO. GN21222.CO.04

WELL: L-8S

LOCATION: Moody AFB, Valdosta,GA Landfill

COUNTY: ____ STATE: GA

GROUND ELEVATION: ____

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 217.65 NGVD

DATE: 1-12-87

(1) CASING: 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/24/86

PUMPING TEST

SPECIFIC YIELD ____ gpm/ft @ ____ gpm

WATER ANALYSIS (ppm)

TDS ____

TOTAL HARDNESS[1] ____

M.O. ALKALINITY[1] ____

CHLORIDE Cl ____

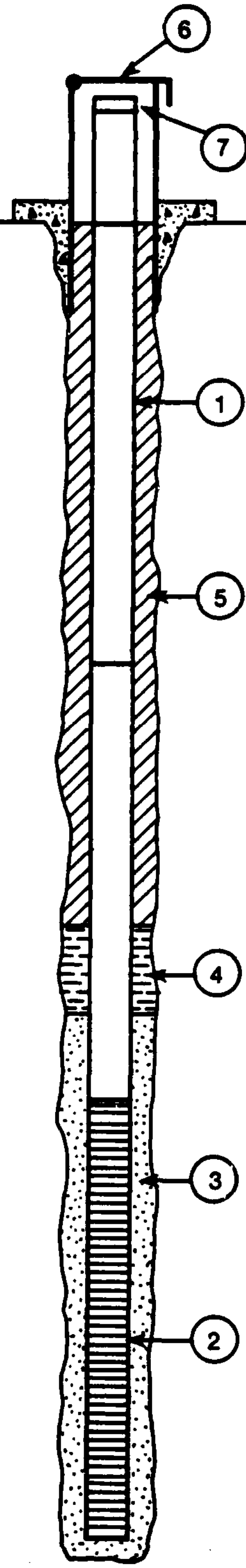
IRON Fe ____

SULFATE SO_4 ____

COLOR (APHA) ____

CALCIUM[1] ____

DEPTH	CLASSIFICATION
0–13	Mod. yellowish brown 10 YR 5/4 to pale reddish brown 10 R 5/4 to very light gray N8, interbedded limonitic and kaolinitic quartz fine sandy clay, stiff, hard, dry.
13–23	Grayish orange 10 YR 7/4 to very light gray N7, interbedded clayey (kaolin) quartz, fine sand, stiff, becoming moist below 18 feet.
23–30	Grayish orange 10 YR 7/4 to very light gray N7, kaolinitic clay (marl), dense, stiff, hard with saturated quartz fine sand seams.



(3) 20-30 Mesh Silica Sand

(4) Bentonite Pellets

(5) ASTM Type I Cement

(6) Protective Vault

(7) Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-25-86

[1] AS $CaCO_3$

FORM 361

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	L-8S	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ________ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ________ START 11/24/86 FINISH 11/24/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								HNU Malfunction vapor levels not available
		3-5	SS1	18"	6-8-11-13	Mod yellowish brown 10YR5/4 to pale reddish brown 10R5/4 to very light gray N8, interbedded limonitic and kaolinitic qtz fine sandy clay, stiff, hard, dry.		
	5							
		8-10	SS2	18"	23-22-18-22	Mod brown 5YR4/4 to mod red 5R4/6 to very light gray N7, interbedded limonitic and kaolinitic clayey quartz, fine sand, stiff, hard, dry		
	10							
		13-15	SS3	18"	7-8-11-14	Grayish orange 10YR7/4 to very light gray N7, interbedded clayey (kaolin) quartz fine sand, stiff, dry		
	15							
		18-20	SS4	18"	6-7-11-10	As above (moist)		
	20							
		23-25	SS5	18"	3-6-8-8	Grayish orange 10YR7/4 to very light gray N7, clayey quartz, coarse to fine sand, stiff, moist		
	25							
		28-30	SS6	18"	6-12-18-41	Grayish orange 10YR7/4 to very light gray N7, kaolinitic clay (marl), dense, stiff hard, moist with saturated sand seams		
	30							

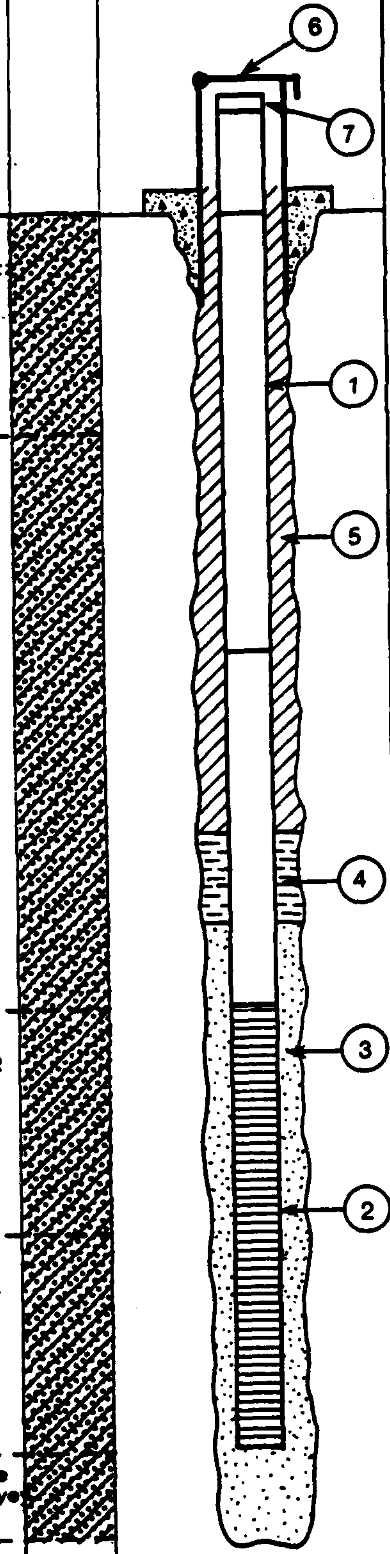
Page __ of __

CH2M HILL WELL DRILLING REPORT

PROJECT NO. GN21222.C0.04

DEPTH	CLASSIFICATION
0–5	Grayish orange 10 YR 7/4, quartz very fine sandy clay, dense, moderately plastic, dry.
5–18	Yellowish gray 5 Y 8/1 to mod yellowish brown 10 YR 5/4, interbedded clayey (kaolin), quartz fine sand, moderately plastic, dry.
18–23	Moderate yellowish brown 10 YR 5/4, quartz fine sandy clay, plastic, moist.
23–28	Yellowish gray 5 Y 8/1 to mod. yellowish brown 10 YR 5/4, interbedded clayey (kaolin), quartz fine sand, moderately plastic, dry.
28–30	Grayish orange 10YR7/4 to pale yellowish orange 10YR8/6, clayey quartz coarse to fine sand, saturated, mod cohesive.

LOG / CONSTRUCTION



WELL: L-9S

LOCATION: Moody AFB, Valdosta, GA
Landfill

COUNTY: ____ STATE: GA

GROUND ELEVATION: ____

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 28-feet

STATIC WATER LEVEL: 215.76 NGVD

DATE: 1-12-87

(1) CASING: 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/23/86

PUMPING TEST

SPECIFIC YIELD ____ gpm/ft @ ____ gpm

WATER ANALYSIS (ppm)

TDS ____

TOTAL HARDNESS[1] ____

M.O. ALKALINITY[1] ____

CHLORIDE Cl ____

IRON Fe ____

SULFATE SO_4 ____

COLOR (APHA) ____

CALCIUM[1] ____

(3) 20-30 Mesh Silica Sand

(4) Bentonite Pellets

(5) ASTM Type I Cement

(6) Protective Vault

(7) Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-23-86

[1] AS $CaCO_3$

FORM 361

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-9S	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-23-86 FINISH 11-23-86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								HNU malfunction vapor levels not available
		3-5	SS1	18"	3-4-6-9	Grayish orange 10YR7/4, quartz very fine sandy clay, dense, moderately plastic, dry		
	5							
		8-10	SS2	18"	5-13-15-17	Yellowish gray 5Y8/1 to mod yellowish brown 10YR5/4, interbedded clayey (kaolin) quartz fine sand, mod plastic, dry		
	10							
		13-15	SS3	18"	3-4-6-10	As above		
	15							
		18-20	SS4	18"	2-5-8-13	Moderate yellowish brown 10YR5/4, quartz fine sandy clay, plastic, moist		
	20							
		23-25	SS5	18"	4-14-25-47	Yellowish gray 5Y8/1 to mod yellowish brown 10YR5/4, interbedded clayey (kaolin) quartz fine sand, mod plastic, dry		
	25							
		28-30	SS6	18"	2-7-5-4	Grayish orange 10YR7/4 to pale yellowish orange 10YR8/6, clayey quartz coarse to fine sand, saturated, mod cohesive		
	30							

REV 11/82 FORM D1586

Page ___ of ___

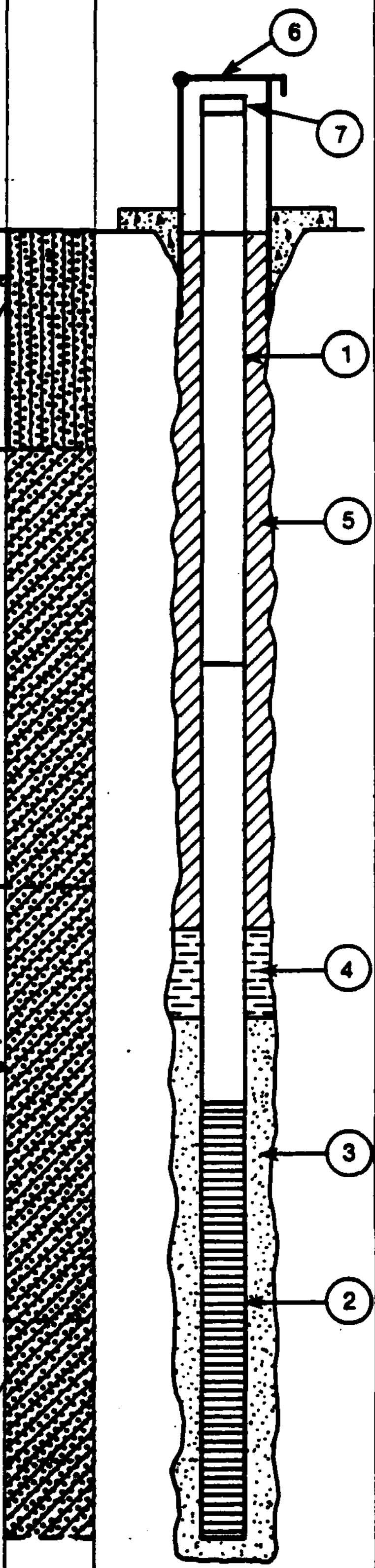
WELL DRILLING REPORT

CH2M HILL

DEPTH	CLASSIFICATION
0–5	Grayish orange 10 YR 7/4, quartz fine sandy silt, hard, dense, dry
5–15	Light gray N8, clayey (kaolin), quartz very fine sand, hard, dense, stiff, dry.
15–25	Interbedded light gray N8 and light brown 5 YR 5/6, clayey quartz, fine sand, stiff to mod. plastic, moist in 18'-20' sample
25–30	Grayish orange 10 YR 7/4, clayey quartz, fine sand, moderately consolidated, saturated.

LOG

CONSTRUCTION



PROJECT NO. GN21222.C0.04

WELL: L-10S

LOCATION: Moody AFB, Valdosta, GA

Landfill

COUNTY: ___ STATE: GA

GROUND ELEVATION: ___

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 214.72 NGVD

DATE: 1-12-87

① CASING. 2" Integral Thread PVC

② SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/20/86

PUMPING TEST

SPECIFIC YIELD ___ gpm/ft @ ___ gpm

WATER ANALYSIS (ppm)

TDS ___

TOTAL HARDNESS[1] ___

M.O. ALKALINITY[1] ___

CHLORIDE Cl ___

IRON Fe ___

SULFATE SO_4 ___

COLOR (APHA) ___

CALCIUM[1] ___

③ 20-30 Mesh Silica Sand

④ Bentonite Pellets

⑤ ASTM Type I Cement

⑥ Protective Vault

⑦ Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-19-86

[1] AS $CaCO_3$

FORM 381

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	L-10S	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11/20/86 FINISH 11/20/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION	
								Organic Vapor Head Space in ppm Benzene Equivalents	
								BKG.	SAMPLE
	5	3-5	SS 1	18"	15-10-9-7	Grayish orange 10 YR 7/4, quartz fine sandy silt, hard, dense, dry		0.2	1.0
	10	8-10	SS 2	18"	20-26-25-30	Light gray N8, Clayey (Kaolin) quartz very fine sand, hard, dense, stiff, dry		0.2	0.2
	15	13-15	SS 3	18"	9-9-16-20	As above		0.2	0.2
	20	18-20	SS 4	18"	6-7-8-12	As above with light brown 5 YR 5/6 clayey quartz fine sand, stiff to moderately plastic, moist		0.2	0.2
		23-25	SS 5	18"	9-8-8-12	As above (Interbedded)		0.2	0.2
	30	28-30	SS 6	18"	3-1-2-3	Grauish orange 10 YR 7/4, Clayey quartz fine sand, moderately consolidated, saturated		0.2	0.2

REV 11/82 FORM D1586

Page ___ of ___

WELL DRILLING REPORT

CH2M HILL

PROJECT NO. GN21222.C0.04

WELL: L-11S

LOCATION: Moody AFB, Valdosta, GA Landfill

COUNTY: ______ STATE: GA

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 215.91 NGVD

DATE: 1-12-87

(1) CASING: 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/19/86

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______ gpm

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

(3) 20-30 Mesh Silica Sand

(4) Bentonite Pellets

(5) ASTM Type I Cement

(6) Protective Vault

(7) Locking Cap

COMPILED BY B. Painter (EWM)

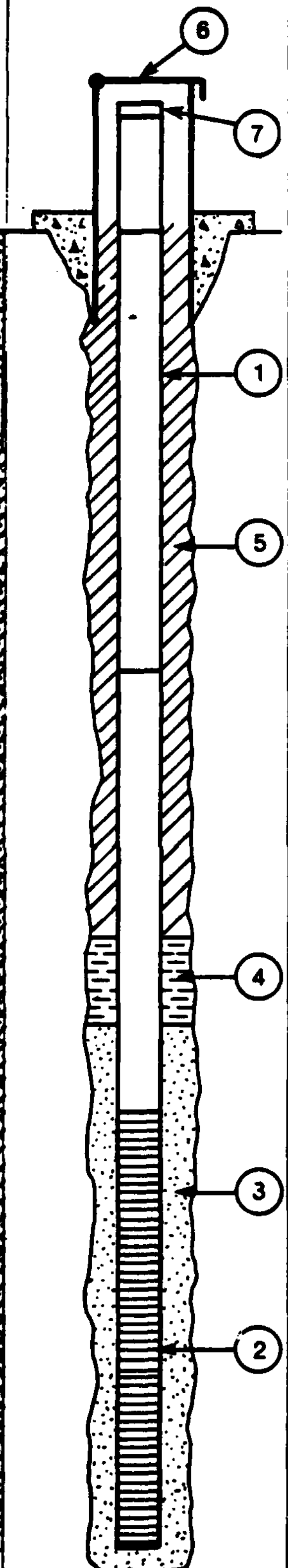
DATE 11-19-86

[1] AS $CaCO_3$

DEPTH	CLASSIFICATION
0–5	Grayish orange 10 YR 7/4, quartz sandy silt, dense, hard, dry
5–10	Pinkish gray 5 YR 8/1, clayey (kaolin) quartz very fine sand, stiff, dry
10–23	Interbedded clayey sand as above and moderate reddish brown 10 R 4/6 clayey quartz fine sand, dense, stiff, dry
23–28	Interbedded very light gray N8 and grayish orange 10 YR 6/6 clayey quartz fine sand, moderately plastic, dry
28–30	Dark yellowish orange 10YR6/6 clayey quartz fine to med sand, moist, mod plastic, past[illegible]

LOG

CONSTRUCTION



FORM 361

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	L-11S	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11/19/86 FINISH 11/19/86 LOGGER B. Painter (EWM)

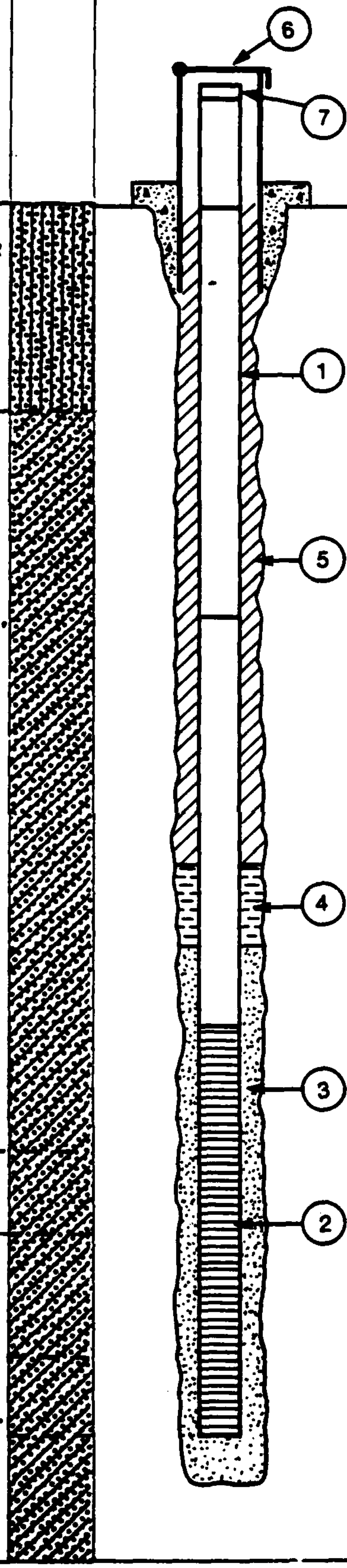
ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION	
								Organic Vapor Head Space in ppm Benzene Equivalents BKG.	SAMPLE
	5	3-5	SS 1	12"	7-10-15-22	Grayish orange 10 YR 7/4, quartz fine sandy silt, dense, hard, dry		0.2	0.3
	10	8-10	SS 2	14"	10-10-12-15	Pinkish gray 5 YR 8/1, Clayey (Kaolin) quartz very fine sand, stiff, dry		0.2	0.2
	15	13-15	SS 3	14"	4-11-16-17	Interbedded clayey sand as above and moderate reddish brown 10 R 4/6, clayey quartz fine sand, dense, stiff dry		0.2	1.6
	20	18-20	SS 4	18"	5-10-12-20	As above		0.2	0.2
	25	23-25	SS 5	18"	7-9-17-26	Grayish orange 10 YR 7/4 clayey quartz fine sand, stiff, moderately consolidated, water in sampler		0.2	0.2
	30								

REV 11/82 FORM D1586

CH2M HILL WELL DRILLING REPORT

DEPTH	CLASSIFICATION
0–5	Moderate yellowish brown 10 YR 5/4 to light brown 5 YR 5/6, quartz sandy silt, cohesive, moist.
5–23	Very light gray N8, clayey (kaolin) quartz very fine sand, dense, slightly plastic, dry.
23–25	Interbedded very light gray N8 and grayish orange 10YR7/4 clayey quartz fine sand, mod plastic, dry.
28–30	Dark yellowish orange 10YR6/6 clayey quartz fine to medium sand, moist, mod plastic, peat.

LOG / CONSTRUCTION



PROJECT NO. GN21222.CO.04

WELL: L-12S

LOCATION: Moody AFB, Valdosta,GA
Landfill - Perimeter

COUNTY: ______ STATE: GA

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 216.91 NGVD

DATE: 1-12-87

(1) CASING: 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/19/86

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____ gpr

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

(3) 20-30 Mesh Silica Sand

(4) Bentonite Pellets

(5) ASTM Type I Cement

(6) Protective Vault

(7) Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-19-86

[1] AS $CaCO_3$

FORM 361

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	L-12S	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE START 11/19/86 FINISH 11/19/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION — Organic Vapor Head Space in ppm Benzene Equivalents BKG.	SAMPLE
		3-5	SS 1	3"	1-14-12-11	Moderate yellowish brown 10 YR 5/4 to light brown 5 YR 5/6, quartz fine sandy silt, cohesive, moist		0.2	0.2
	5								
		8-10	SS 2	12"	8-13-14-18	Very light gray N8, clayey (Kaolin) quartz very fine sand, stiff, dry		0.2	0.2
	10								
		13-15	SS 3	12"	10-12-15-17	Very light gray N8, clayey (Kaolin) quartz very fine sand, dense, slightly plastic, dry		0.2	0.2
	15								
		18-20	SS 4		14-23-20-17	As above		0.2	0.2
	20								
		23-25	SS 5		18-25-21-26	Interbedded very light gray N8, Clayey (Kaolin) very fine sand, and grayish orange 10 YR 7/4, clayey quartz fine sand, moderately plastic, dry		0.2	0.2
	25								
		28-30	SS 6		5-7-10-13	Dark yellowish orange 10 YR 6/6, clayey quartz fine to medium sand, moist, moderately plastic, interbedded peat		0.2	0.2
	30								

CH2M HILL

WELL DRILLING REPORT

PROJECT NO. GN21222.CO.0

- WELL: L-13D
- LOCATION: Moody AFB, Valdosta, GA Landfill, Perimeter
- COUNTY: ____ STATE: GA
- GROUND ELEVATION: ____
- DIAMETER: 2-inch Sch. 80 PVC
- DEPTH: ~77-feet
- STATIC WATER LEVEL: 199.25 NGVD
- DATE: 1-12-87
- (1) CASING: 2" Integral Thread PVC
- (2) SCREEN: 2" PVC 0.010" Slot with Monoplex Sock
- CONSTRUCTION: Hollow Auger
- DRILLER: Liberty Drilling Ocala, FL
- DATE FINISHED: 11-26-86

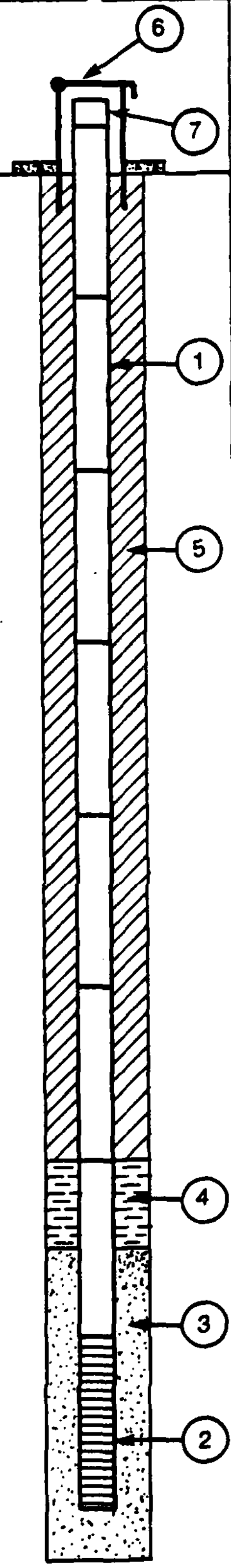
PUMPING TEST

SPECIFIC YIELD ____ gpm/ft @ ____

WATER ANALYSIS (ppm)

- TDS ____
- TOTAL HARDNESS[1] ____
- M.O. ALKALINITY[1] ____
- CHLORIDE Cl ____
- IRON Fe ____
- SULFATE SO_4 ____
- COLOR (APHA) ____
- CALCIUM[1] ____

DEPTH	CLASSIFICATION	LOG	CONSTRUCTION
0	Moderate yellowish brown, quartz very fine sandy clay, stiff, hard, dry.		
	Very light gray, clayey quartz, very fine sand, interbedded with dark reddish brown quartz, fine sandy clay.		
20	Grayish yellow clayey quartz, fine sand, loose, saturated, and very light gray quartz, very fine sandy clay.		
	Pinkish gray clayey quartz, very fine sand, saturated.		
30	Light olive gray clayey quartz, very fine to coarse sand, moist, moderately plastic.		
	Yellowish gray to brownish gray clayey quartz, fine sand, loose, moist.		
	Sampling was discontinued below this depth due to the presence of non-organic vapors emitted from the bore hole. The following log represents the materials penetrated based on previous test holes and drilling rate.		
80			



(3) 20-30 Mesh Silica Sand

(4) 15-Gallon Bentonite Spacer

(5) ASTM Type I - Portland Cement

(6) Protective Vault

(7) Locking Cap

COMPILED BY E. W. Meyer

DATE 11-26-86

[1] AS $CaCO_3$

FORM 36

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-13D	SHEET 1 OF 2

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8 -Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-25-86 FINISH 11-26-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION	
								Organic Vapor Head Space in ppm Benzene Equivalents	
								BKG	SAMPLE
		3-5	SS1	22"	19-18-18-17	Moderate yellowish brown 10YR5/4 quartz very fine sandy clay, stiff, hard, dry		0.2	0.2
	5								
		8-10	SS2	16"	8-14-22-27	Very light gray N8, clayey very fine quartz sand, loose, interbedded with dark reddish brown 10R3/4, quartz very fine sandy clay		0.2	θ
	10								
		13-15	SS3	20"	9-15-12-21	Very light gray N8, quartz very fine sandy clay, stiff, dense, moderately plastic		0.2	θ
	15								
		18-20	SS4	21"	7-8-14-15	As above		0.2	θ
	20								
		23-25	SS5	21"	5-6-7-8	Grayish yellow 5Y8/4 clayey quartz fine sand, loose, saturated, and very light gray N8, quartz very fine sandy clay		0.2	θ
	25								
		28-30	SS6	22"	6-4-3-4	Pinkish gray 5YR8/1, clayey quartz very fine sand, and mod yellowish brown 10YR5/4, clayey very fine quartz sand, saturated		0.2	0.4
	30								

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-13D	SHEET 2 OF 2

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA
ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida
DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler
WATER LEVEL AND DATE ______ START 11-25-86 FINISH 11-26-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								Organic Vapor Head Space in ppm Benzene Equivalents BKG. SAMPLE
		33-35	SS7	22"	9-7-4-4	Light olive gray 5Y6/1, clayey quartz, very fine to coarse sand, moist, mod. plastic		0.2 0.4
	35							
		38-40	SS8	23"	12-9-8-9	Yellowish gray 5Y8/1, clayey quartz fine sand, loose, moist		0.2 0.2
	40							
		43-45	SS9	22"	7-13-20-25	Yellowish gray 5Y8/1 to brownish gray 5YR4/1, clayey quartz fine sand, loose, moist.		0.2 0.2
	45					Splitspoon sampling below this depth was discontinued due to the presence of non-organic vapors emitted from the borehole.		
						Health and Safety Level C was implemented. The borehole was completed at 82 feet after penetrating the greenish gray Hawthorn		
	50					Clay. The approximate depth to the top of the Hawthorn is 77 feet. There is 10 to 15 feet of sand and pebble phosphate above this clay unit.		
	55					Fluids produced from the drilling rods registered organic vapor levels as high as 15 ppm benzene equivalents.		

REV 11/82 FORM D158

CH2M HILL

WELL DRILLING REPOR

PROJECT NO. GN21222.CO.C

WELL: L-14D

LOCATION: Moody AFB, Valdosta, GA
Landfill, Perimeter

COUNTY: ______ STATE: G

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 80-feet

STATIC WATER LEVEL: 198.49 NGVD

DATE: 1-12-87

(1) CASING: 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010" Slot with Monoplex Sock

CONSTRUCTION: Hollow Auger

DRILLER: Liberty Drilling
Ocala, FL

DATE FINISHED: 11/25/86

PUMPING TEST

SPECIFIC YIELD _____ gpm/ft @ _____

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

(3) 20-30 Mesh Silica Sand

(4) 15-Gallon Bentonite Spacer

(5) ASTM Type I - Portland Cement

(6) Protective Vault

(7) Locking Cap

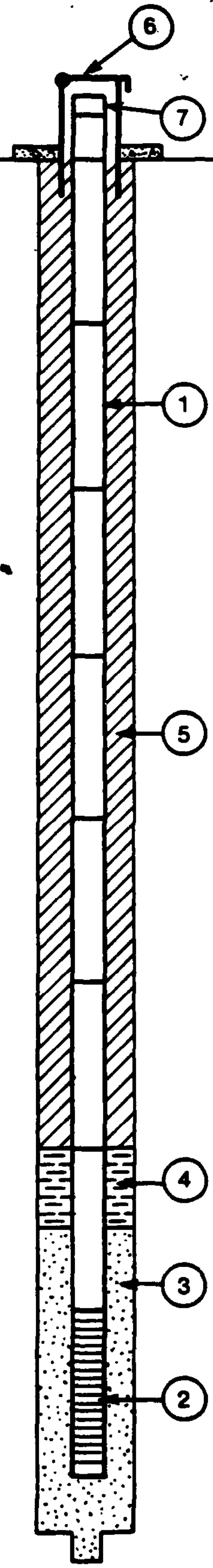
COMPILED BY E. W. Meyer

DATE ______

[1] AS $CaCO_3$

DEPTH	CLASSIFICATION	LOG
0–40	Dark yellowish brown, quartz, fine sandy clay, interbedded with white to red sandy kaolin clay, moist, mod. plastic, water in sampler at 35-feet.	
40	Grayish orange quartz, fine to med. sand, loose, saturated, interbedded with white sandy kaolin clay.	
	Grayish orange quartz, fine to medium sand, loose, saturated.	
50	Grayish orange clayey quartz, fine sand, loose, moist.	
	Grayish orange to mod. yellowish brown, clayey quartz, fine to medium sand, moist, mod. plastic	
60	Grayish orange, quartz, fine to coarse sand, and interbedded clay, moist, mod. plastic.	
70	Grayish orange to pale yellowish orange, clayey, fine to coarse sand and pebble phosphate, moist, cohesive.	
80	Greenish gray clay (marl), very stiff, dry.	

CONSTRUCTION



CH2M

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-14D	SHEET 1 OF 3

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-23-86 FINISH 11-25-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						Refer to boring log for Well 11S for details from 0-35 feet depth.		Organic Vapor Head Space in ppm Benzene Equivalents BKG. SAMPLE
		3-5	SS1					
	5							
		8-10	SS2					
	10							
		13-15	SS3					
	15							
		18-20	SS4					
	20							
		23-25	SS5					
	25							
		28-30	SS6					
	30							

REV 11/82 FORM D158

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-14D	SHEET 2 OF 3

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ________ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ________ START 11-23-86 FINISH 11-25-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION — Organic Vapor Head Space in ppm Benzene Equivalents: BKG.	SAMPLE
		33-35	SS7	24"	6-11-10-11	Dark yellowish orange 10YR6/6 quartz fine sandy clay, finely interbedded with white to red sandy kaolin clay, moist, stiff, water in sampler.		0.2	0.4
	35								
		38-40	SS8	18"	2-5-4-6	Dark yellowish orange 10YR6/6 to pale brown 5YR5/2, quartz very fine sandy clay moist, moderately plastic		0.0	θ
	40								
		43-45	SS9	20"	4-8-14-18	Grayish orange 10YR7/4, quartz fine to medium sand, loose, saturated, interbedded with white sandy kaolin clay, stiff.		0.0	θ
	45								
		48-50	SS10	24"	6-5-4-10	Grayish orange 10YR7/4, clayey quartz fine to medium sand, loose, saturated.		0.0	θ
	50								
		53-55	SS11	24"	5-4-5-9	Grayish orange 10YR7/4, clayey quartz, fine sand, loose, moist.		0.0	θ
	55								
		58-60	SS12	24"	5-8-9-11	Grayish orange 10YR7/4 to moderate yellowish brown 10YR5/4, clayey quartz fine to medium sand, moist, moderate plastic.		0.0	θ
	60								

CH M

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-14D	SHEET 3 OF 3

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-23-86 FINISH 11-25-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								Organic Vapor Head Space in ppm Benzene Equivalents BKG. SAMPLE
		63-65	SS13	24"	3-2-1-2	Grayish orange 10YR7/4, interbedded clayey quartz, fine sand and clay, moist, mod. plastic		0.0 0.0
	65							
		68-70	SS14	24"	5-6-7-8	Grayish orange 10YR7/4 to light gray N7, interbedded clayey quartz fine to coarse sand, and clay very fine sand (light gray		0.0 0.0
	70							
		73-75	SS15	24"	7-6-8-7	Grayish orange 10YR7/4 to pale yellowish orange 10YR8/6, clayey fine to coarse quartz sand, and grayish orange pink 5YR7/2, pebble phosphate.		0.0 0.0
	75							
		78-80	SS16	22"	7-9-7-9	Pale yellowish brown 10YR6/2 clayey quartz fine to coarse sand, and pebble phosphate moist, cohesive.		0.0 0.0
	80							
		83-85	SS17			Greenish gray 5GY6/1, clay (marl), very stiff, dry		0.0 0.0
	85							
	90							

CH2M HILL WELL DRILLING REPOR'

PROJECT NO. GN21222.C0.04

WELL: L-15D

LOCATION: Moody AFB, Valdosta, GA

Landfill, Perimeter

COUNTY: ______ STATE: GA

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 80 -feet

STATIC WATER LEVEL: 197.12 NGVD

DATE: 1-12-87

1 CASING: 2" Integral Thread PVC

2 SCREEN: 2" PVC 0.010" Slot with Monoplex Sock

CONSTRUCTION: Hollow Auger

DRILLER: Liberty Drilling Ocala, FL

DATE FINISHED: 11/21/86

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______ g

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

3 20-30 Mesh Silica Sand

4 15-Gallon Bentonite Spacer

5 ASTM Type I - Portland Cement

6 Protective Vault

7 Locking Cap

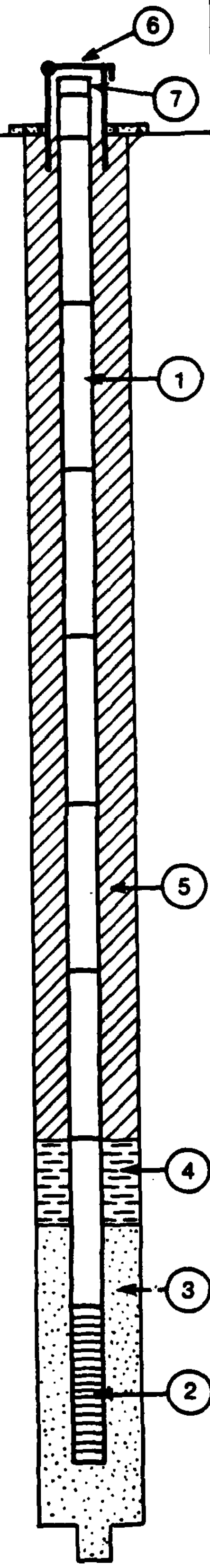
COMPILED BY E. W. Meyer

DATE 11-21-86

[1] AS $CaCO_3$

DEPTH	CLASSIFICATION
0	Moderate yellowish brown to light brown, quartz, fine sandy silt, cohesive, dry.
	Moderate brown, clayey, quartz, fine sand, stiff, dry, interbedded with red clay.
10	Very light gray kaolin clay, moderately plastic, dry.
	Very light gray, quartz, fine sandy kaolin clay, moderately plastic, dry.
20	Interbedded very light gray kaolin clay and yellowish gray marl, stiff, dry.
30	Grayish yellow quartz, fine sand clay, moist, very plastic, zone of saturation below 30-feet.
40	Pale yellowish orange to grayish yellow quartz, fine sandy clay and quartz sandstone pebbles.
	Dark yellowish orange, quartz, very fine sand to sandy clay with interbedded white quartz fine sandstone.
50	Yellowish gray, quartz, fine sandy clay, pasty to plastic, moist.
	Grayish orange clay and mod. yellowish brown, quartz, fine sand beds, very plastic, moist.
60	Pinkish gray, quartz, med. to coarse sand with pebble phosphate, loose, saturated.
70	Light brownish gray quartz, coarse sand and pebble phosphate interbedded with grayish orange marl.
80	Light greenish gray, clay (marl) very stiff, dry.

CONSTRUCTION



FORM 361

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-15D	SHEET 1 OF 3

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-17-86 FINISH 11-21-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION — Organic Vapor Head Space in ppm Benzene Equivalents BKG.	SAMPLE
		3-5	SS1	21"	5-11-9-9	Mod yellowish brown 10YR5/4 to light brown 5YR5/6, quartz fine sandy silt, cohesive dry.		0.2	0.2
	5								
		8-10	SS2	18"	2-4-10-10	Mod brown 5YR4/4, clayey quartz fine sand stiff, dry, interbedded with 1-2mm bed of red clay.		0.2	0.2
	10								
		13-15	SS3	22"	8-11-12-12	Very light gray N8, kaolin clay, moderate plastic, dry		0.2	0.2
	15								
		18-20	SS4	23"	5-8-13-16	Very light gray N8, quartz fine sandy kaolin clay, moderately plastic, dry		0.2	0.2
	20								
		23-25	SS5	22"	2-8-8-10	Interbedded very light gray N8, kaolin clay and yellowish gray 5Y7/2 marl, bed thickness ± 1 cm, stiff, dry		0.2	0.2
	25								
		28-30	SS6	22"	10-17-7-9	Grayish yellow 5Y8/4, quartz fine sandy kaolin clay, plastic, dry		0.2	0.2
	30								

CH2M HILL

PROJECT NUMBER	BORING NUMBER
GN21222.CO.04	L-15D SHEET 2 OF 3

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-17-86 FINISH 11-21-86 LOGGER E.W. Meyer

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION — Organic Vapor Head Space in ppm Benzene Equivalents: BKG.	SAMPLE
	35	33-35	SS7	22"	6-11-14-14	Grayish yellow 5Y8/4 to mod yellowish brown 10YR5/4, quartz fine sandy clay, v plastic, moist, water recovered in sampler		0.2	0.2
	40	38-40	SS8	23"	4-5-6-8	Pale yellowish orange 10YR8/6 to grayish yellow 5Y8/4, quartz fine sandy clay with fine quartz, sandstone pebbles, plastic dry.		0.2	0.2
	45	43-45	SS9	23"	3-4-5-6	Grayish yellow 5Y8/4, quartz fine sandy clay,plastic, dry, with quartz fine sandstone.		0.2	0.2
	50	48-50	SS10	24"	5-14-11-10	Dark yellowish orange 10YR6/6, quartz very fine sand to fine sandy clay with interbedded white quartz fine sandstone.		0.2	0.2
	55	53-55	SS11	24"	8-5-6-6	Yellowish gray 5Y8/1, quartz fine sandy clay, plastic to pasty, moist.		0.2	0.2
	60	58-60	SS12	24"	3-4-6-7	Grayish orange 10YR7/4, clay with mod. yellowish brown 10YR5/4 quartz fine sand beds (±4 cm), very plastic, moist		0.2	0.2

PROJECT NUMBER	BORING NUMBER	
GN21222.CO.04	L-15D	SHEET 3 OF 3

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, GA

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 8-Inch Hollow Stem Auger / 24-Inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11-17-86 FINISH 11-21-86 LOGGER E.W. Meyer

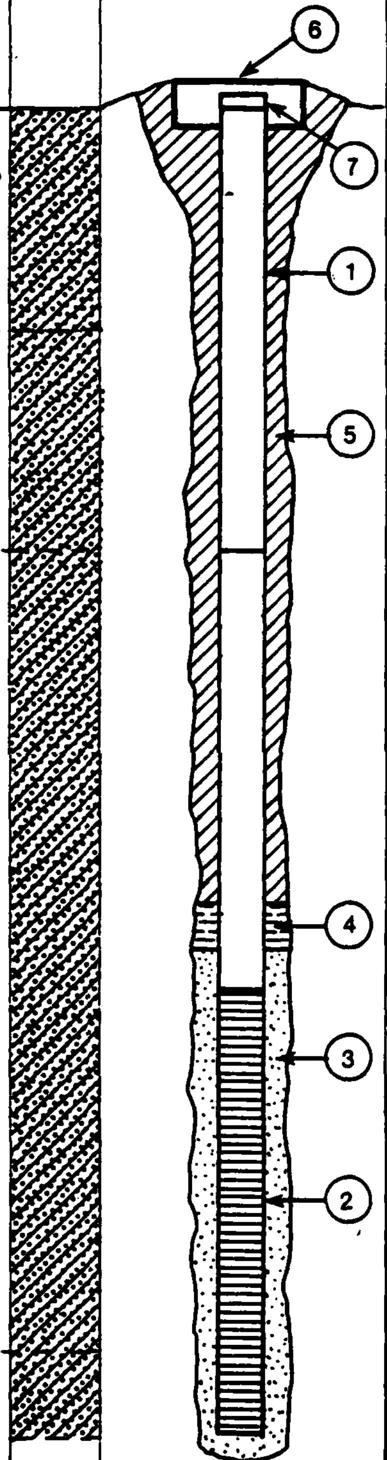
ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION — Organic Vapor Head Space in ppm Benzene Equivalents: BKG.	SAMPLE
		63-65	SS13	24"	8-15-12-9	Pinkish gray 5YR8/1, quartz med to coarse sand with pebble phosphate, loose, saturated		0.2	0.2
	65								
		68-70	SS14	24"	6-6-9-11	Light brownish gray 5YR6/1, quartz coarse sand and pebble phosphate, interbedded with grayish orange 10YR7/4 marl.		0.2	0.2
	70								
		73-75	SS15	24"	4-5-8-11	As above		0.2	0.2
	75								
		78-80	SS16	21"	4-5-8-11	Light greenish gray 5GY8/1, clay (marl), very stiff, dry, interface at 79'		0.2	0.2
	80								
		83-85	SS17	22"	8-14-29-30	As above		0.2	0.2
	85								

CH2M HILL

WELL DRILLING REPORT

DEPTH	CLASSIFICATION
0	Dark yellowish orange 10 YR 6/6 and brownish black 5 YR 2/1 clayey quartz very fine sand, cohesive dense, dry.
5	Yellowish gray 5 Y 7/2 to dark reddish brown 10 R 3/4, inter-bedded clay and clayey quartz fine sand, plastic, moist.
10	Very light gray N8, clayey (kaolin) quartz fine to medium sand, dense, stiff, dry.
15	
20	
25	
	Grayish orange 10 YR 7/4 clayey quartz fine to medium sand, cohesive, saturated.
30	

LOG / CONSTRUCTION



PROJECT NO. GN21222.C0.04

WELL: MUS-1

LOCATION: Moody AFB, Valdosta,GA Landfill

COUNTY: ______ STATE: GA

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 216.78 NGVD

DATE: 1-12-87

1. CASING: 2" Integral Thread PVC
2. SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/25/86

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______ gpm

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

3. 20-30 Mesh Silica Sand
4. Bentonite Pellets
5. ASTM Type I Cement
6. Protective Vault
7. Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-25-86

[1] AS $CaCO_3$

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	MUS-1	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11/25/86 FINISH 11/25/86 LOGGER B. Painter (EWM)

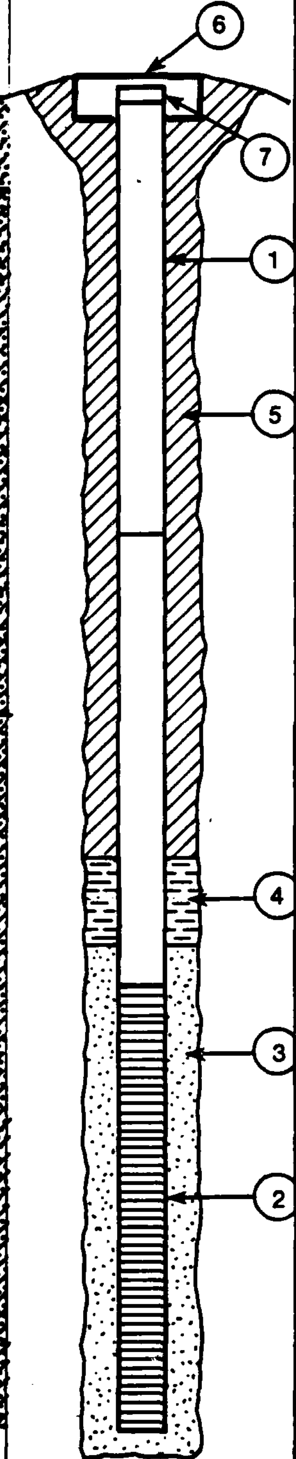
ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								No organic vapor concentrations available
	5	3-5	SS 1	12"	9-7-9-7	Dark yellowish orange 10 YR 6/6 and brownish black 5 YR 2/1, Clayey quartz very fine to fine sand, cohesive, dense, dry		
	10	8-10	SS 2	18"	2-3-3-6	Yellowish gray 5 Y 7/2 to dark reddish brown 10 R 3/4, interbedded clay and clayey quartz fine sand, plastic, moist		
	15	13-15	SS 3	18"	9-15-22-24	Very light gray N8, Clayey (Kaolin) Quartz fine to medium sand, dense, stiff, dry		
	20	18-20	SS 4	14"	8-11-20-21	As above		
	25	23-25	SS 5	12"	7-14-15-20	As above		
	30	28-30	SS 6	18"	9-9-10-18	Grayish orange 10 YR 7/4 Clayey Quartz fine to medium sand, Cohesive, saturated		

Page ___ of ___

WELL DRILLING REPORT

CH2M HILL

DEPTH	CLASSIFICATION	LOG	CONSTRUCTION
0	Grayish brown 5 YR 3/2, humate rich quartz fine sandy clay, moderately plastic, dry.		
	Moderate yellowish brown 10 YR 5/4, clayey, quartz, fine sand, loose, dry		
5	Pale yellowish brown 10 YR 6/2 clayey quartz fine sand, mod. plastic, moist.		
10	Moderate yellowish brown 10 YR 5/4, quartz fine sandy clay, dense, plastic, moist.		
	Pale yellowish brown 10YR6/2 quartzfine sandy clay, plastic dense, moist.		
15	Very light gray N8, clayey (kaolin) quartz, fine sand, mod. plastic, dense, moist.		
	No Recovery		
20	Interbedded very light gray N8 and moderate red 5 R 4/6, quartz fine sandy kaolin clay.		
25			
30	Very light gray N8, clayey (kaolin), quartz, fine sand, moderately consolidated, saturated		



PROJECT NO. GN21222.CO.04

WELL: MUS-2 / SPT

LOCATION: Moody AFB, Valdosta, GA

Landfill

COUNTY: ___ STATE: GA

GROUND ELEVATION: ___

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 217.57 NGVD

DATE: 1-12-87

① CASING: 2" Integral Thread PVC

② SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/25/86

PUMPING TEST

SPECIFIC YIELD ___ gpm/ft @ ___ gpm

WATER ANALYSIS (ppm)

TDS ___

TOTAL HARDNESS[1] ___

M.O. ALKALINITY[1] ___

CHLORIDE Cl ___

IRON Fe ___

SULFATE SO_4 ___

COLOR (APHA) ___

CALCIUM[1] ___

③ 20-30 Mesh Silica Sand

④ Bentonite Pellets

⑤ ASTM Type I Cement

⑥ Protective Vault

⑦ Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-24-86

[1] AS $CaCO_3$

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	MUS-2	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11/25/86 FINISH 11/25/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		0-2	SS 1	12"	4-5-4-8	Grayish brown 5 YR 3/2, Humate rich quartz fine sandy clay and pale yellowish brown 10 YR 6/2 quartz fine sandy clay, moderately plastic, dry		Organic vapor concentration in ppm *Benzene Equivalents* BKG.
		2-4	SS 2	12"	5-9-6-5	Mod. yellowish brown 10 YR 5/4, Clayey quartz fine sand, loose, dry		3-4
	5	4-5	SS 3	18"	5-5-1-2	Pale yellowish brown 10 YR 6/2 Clayey quartz fine sand, mod. plastic, moist		150
		6-8	SS 4	18"	1-2-1-2	As above		50-150
		8-10	SS 5	18"	3-4-7-7	Moderate yellowish brown 10 YR 5/4, Quartz fine sandy clay, dense plastic, moist		100-150
	10	10-12	SS 6	18"	4-7-10-12	As above		< 20
		12-14	SS 7	18"	1-5-9-12	Pale yellowish brown 10 YR 6/2, Quartz fine sandy clay, plastic, dense, moist		20-50
	15	14-16	SS-8	18"	6-8-12-14	Very light gray N8, Clayey (Kaolin) quartz fine sand, moderately plastic, dense, moist		BKG.
		16-18	SS 9	0	10-16-18-25	No Recovery		
		18-20	SS 10			Interbedded very light gray N8 and moderate red 5 R 4/6 quartz fine sandy Kaolin clay, moderately plastic, moist		BKG.
	20							
		23-25				As above		BKG.
	25							
		28-30				Very light gray N8, Clayey (Kaolin) quartz fine sand, moderately consolidated, saturated		BKG.
	30							

REV 11/82 FORM

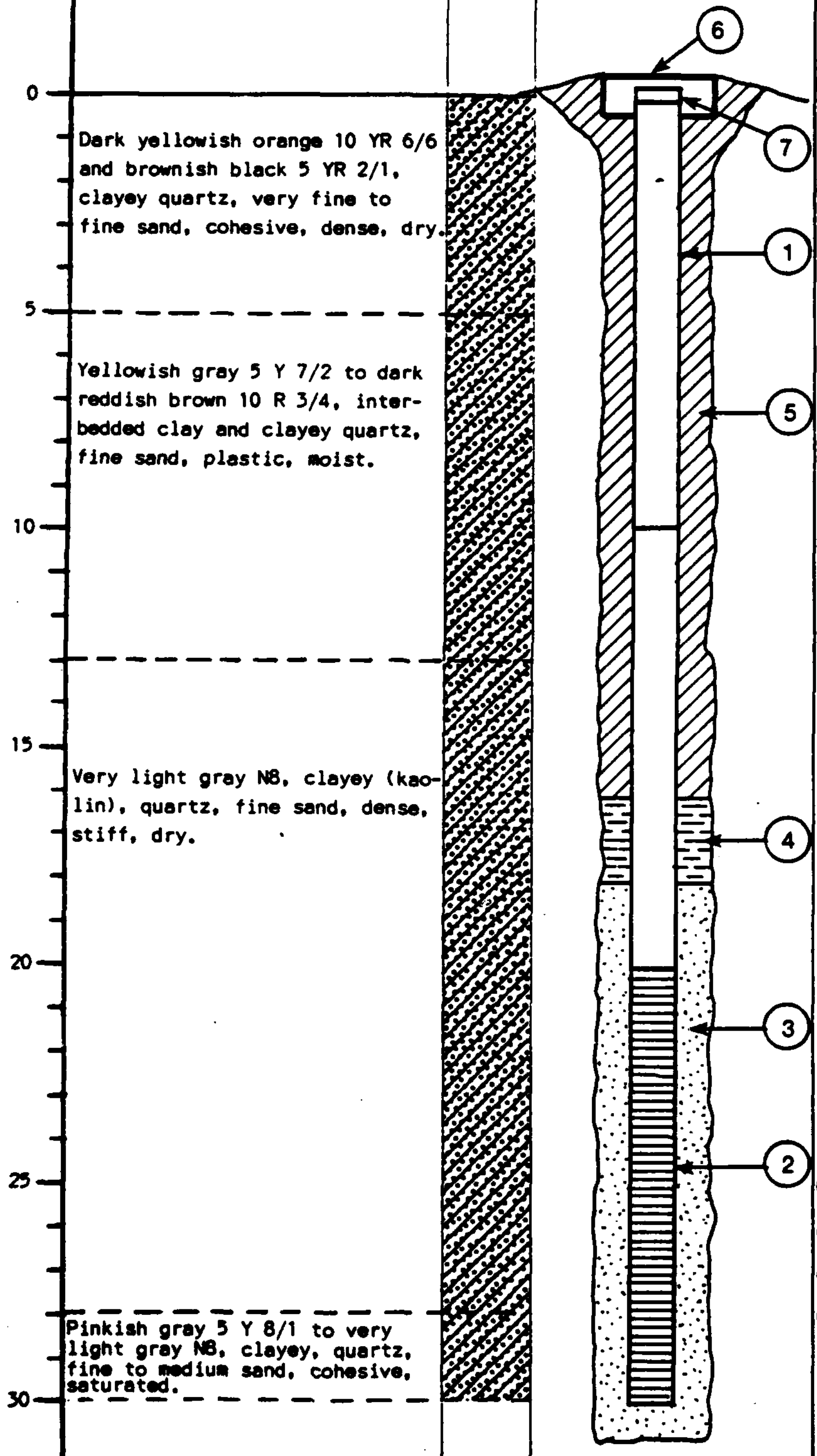
CH2M HILL

WELL DRILLING REP[ORT]

PROJECT NO. GN21222.CO

DEPTH	CLASSIFICATION
0–5	Dark yellowish orange 10 YR 6/6 and brownish black 5 YR 2/1, clayey quartz, very fine to fine sand, cohesive, dense, dry.
5–13	Yellowish gray 5 Y 7/2 to dark reddish brown 10 R 3/4, interbedded clay and clayey quartz, fine sand, plastic, moist.
13–28	Very light gray N8, clayey (kaolin), quartz, fine sand, dense, stiff, dry.
28–30	Pinkish gray 5 Y 8/1 to very light gray N8, clayey, quartz, fine to medium sand, cohesive, saturated.

LOG / CONSTRUCTION



WELL: MUS-3

LOCATION: Moody AFB, Valdosta,

Landfill

COUNTY: ______ STATE:

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 217.95 NGV

DATE: 1-12-87

① CASING: 2" Integral Thread PVC

② SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/25/86

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

③ 20-30 Mesh Silica Sand

④ Bentonite Pellets

⑤ ASTM Type I Cement

⑥ Protective Vault

⑦ Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-25-86

[1] AS $CaCO_3$

FORM

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	MUS-3	SHEET 1 OF 1

SOIL BORING LOG

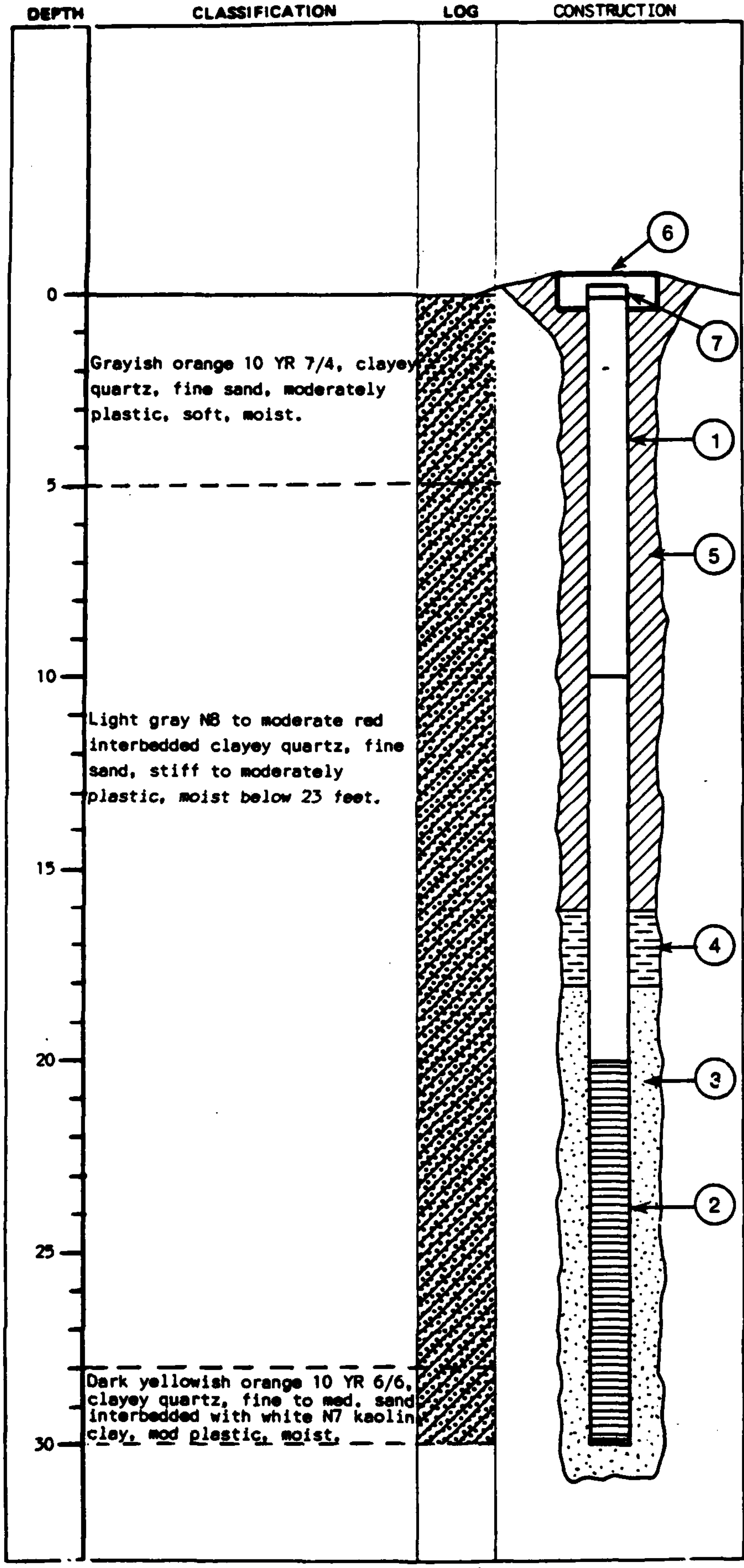
PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

WATER LEVEL AND DATE ______ START 11/25/86 FINISH 11/25/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								HNU Organic Vapor Head Space in ppm Benzene Equivalents
		3-5	SS 1	18"	5-11-8-4	Dark yellowish orange 10 YR 6/6 and brownish black 5 YR 2/1, Clayey quartz very fine to fine sand, cohesive, dense, dry		4
	5							
		8-10	SS 2	18"	3-4-6-15	Yellowish gray 5 Y 7/2 to dark reddish brown 10 R 3/4, Interbedded clay and clayey quartz fine sand, plastic, moist		25-30
	10							
		13-15	SS 3	18"	6-10-12-14	Very light gray N8, Clayey (Kaolin) quartz fine to medium sand, dense stiff, dry		1
	15							
		18-20	SS 4	18"	10-12-17-18	As above		BKG.
	20							
		23-25	SS 5	18"	8-13-15-20	As above		BKG.
	25							
		28-30	SS 6	18"	4-4-5-7	Pinkish gray 5 YR 8/1 to very light gray, N8, Clayey quartz fine to medium sand, cohesive, saturated		BKG.
	30							



CH2M HILL

WELL DRILLING REPOF

PROJECT NO. GN21222.CO.04

WELL: MUS-4

LOCATION: Moody AFB, Valdosta,GA

Landfill

COUNTY: ______ STATE: G

GROUND ELEVATION: ______

DIAMETER: 2-inch Sch. 80 PVC

DEPTH: 30-feet

STATIC WATER LEVEL: 218.36 NGVD

DATE: 1-12-87

(1) CASING 2" Integral Thread PVC

(2) SCREEN: 2" PVC 0.010 Slot with Monoplex Sock

CONSTRUCTION: 4" Solid Auger

DRILLER: Liberty Drilling Ocala, Florida

DATE FINISHED: 11/25/86

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______

WATER ANALYSIS (ppm)

TDS ______

TOTAL HARDNESS[1] ______

M.O. ALKALINITY[1] ______

CHLORIDE Cl ______

IRON Fe ______

SULFATE SO_4 ______

COLOR (APHA) ______

CALCIUM[1] ______

(3) 20-30 Mesh Silica Sand

(4) Bentonite Pellets

(5) ASTM Type I Cement

(6) Protective Vault

(7) Locking Cap

COMPILED BY B. Painter (EWM)

DATE 11-25-86

[1] AS $CaCO_3$

PROJECT NUMBER	BORING NUMBER	
GN21222.C0.04	MUS-4	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Installation Restoration Program Phase II LOCATION Moody AFB, Valdosta, Georgia

ELEVATION ______ DRILLING CONTRACTOR Liberty Drilling, Ocala, Florida

DRILLING METHOD AND EQUIPMENT 4-inch Solid Stem Auger/24-inch Split Spoon Sampler

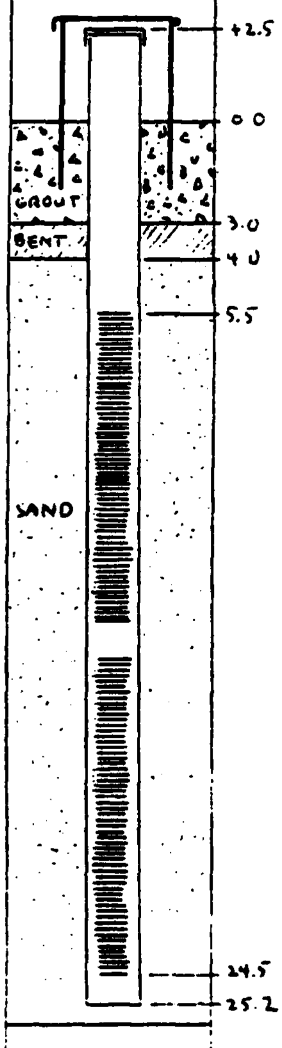
WATER LEVEL AND DATE ______ START 11/25/86 FINISH 11/25/86 LOGGER B. Painter (EWM)

ELEVATION	DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
								No Organic Vapor Concentrations Available
	5	3-5	SS 1	16"	5-2-1-1	Grayish orange 10 YR 7/4 Clayey quartz fine sand, moderately plastic, soft, moist		
	10	8-10	SS 2	18"	10-15-18-16	Light gray N8 to moderate red 5 R 4/6 interbedded clay and clayey quartz fine sand, stiff, dry		
	15	13-15	SS 3	16"	6-13-15-18	Light gray N8 clayey quartz fine sand, moderately plastic, dense, dry		
	20	18-20	SS 4	18"	5-10-12-15	Light gray N8 to moderate red 5 R 4/6 clayey quartz fine sand, stiff, dry		
	25	23-25	SS 5	18"	5-8-10-11	Light gray N8, clayey quartz fine sand, moderately plastic, dense, moist		
	30	28-30	SS 6	18"	6-16-21-22	Dark yellowish orange 10 YR 6/6 clayey quartz fine to medium sand interbedded with white N9 Kaolin clay, moderately plastic, moist		

SHEET 1 OF 1

Boring No. L-1
Hole Size 6 in. Slot 0.01 in.
Screen Size 2 in. Mat'l Sch. 40 PVC
Casing Size 2 in. Mat'l Sch. 40 PVC
Geologist J. Steinberg
Date Start 3/29/84 1640 Finish 3/30/84 1715
Contractor WAR/WTD
Driller P. Wright

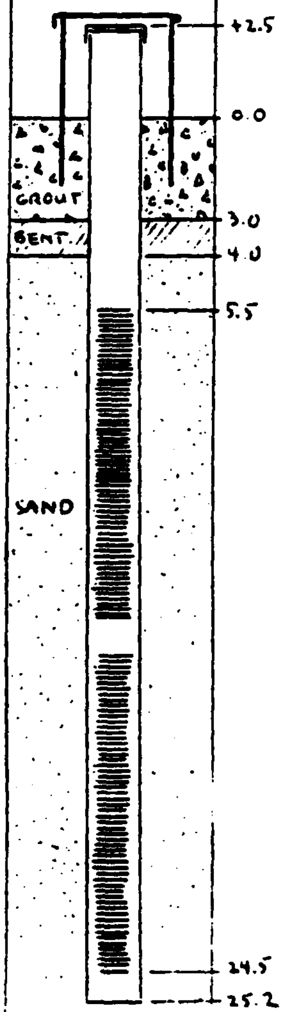
Location Coordinates 350 409.91 N
800 820.25 E
Filter Materials 20-30 Sand
Grout Type Sand Cement
Protective Casing 6-in. steel
Static Water Level
Top of Well Elevation 318.33′ msl
Drill Type 6-in. Hollow Stem Auger



Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
		Surface	Clayey sand, very fine, some organics, black (10YR 2/1), saturated	SC	
		5-6.5 ft	Sandy Clay, 15% sand, brownish yellow (10YR 6/6) 50%, white (10YR 8/1) 10%, Red (10YR 4/8) 40%, moist	CL	5+15
		9-10.5 ft	Clay, 15-20% sand, Coarse to fine, light gray (5YR 7/1), yellowish brown (10YR 5/3) and red (10R 4/8), moist, v stiff	CL	17+21
		15-16.5 ft	Clay, 10-15% sand, fine to V fine, yellowish brown (10YR 5/8) with strong brown (7.5YR 4/6)	CL	13+20
		20-21.5 ft	Clay, 10-15% sand, fine-V fine, yellow (10YR 7/6) 90%, yellowish red (5YR 4/6) 10%, saturated		15+20
		25-26.5 ft	Clay, 10% sand, pale yellow (2.5Y 8/4), saturated	CL	5+8

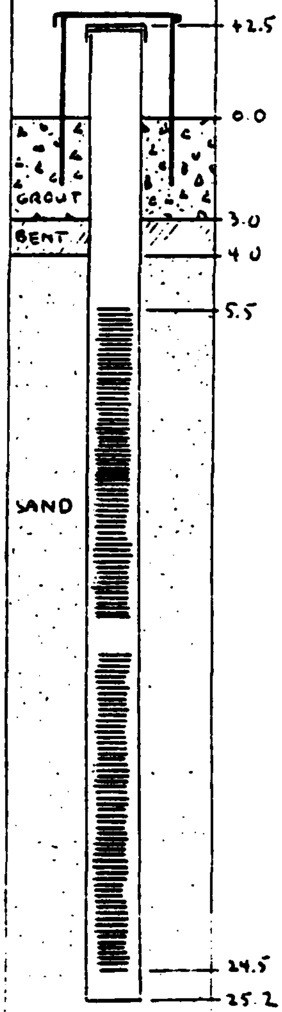
SHEET 1 OF 1

Boring No. L-2	Location Coordinates 350 843.41 N
	799 819.99 E
Hole Size 6 in. Slot 0.01 in.	Filter Materials 20-30 Sand
Screen Size 2 in. Mat'l Sch. 40 PVC	Grout Type Sand Cement
Casing Size 2 in. Mat'l Sch. 40 PVC	Protective Casing 6-in. steel
Geologist J. Steinberg	Static Water Level
Date Start 3/30/84 1000 Finish 3/30/84 1650	Top of Well Elevation 222.35' msl
Contractor WAR/WTD	Drill Type 6-in. Hollow Stem Auger
Driller P. Wright	

Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
	+2.5, 0.0, 3.0, 4.0, 5.5, 24.5, 25.2	Surface	Clayey sand, 30% clay, fine-V fine sand, some organic material, dark gray (10YR 4/1) 50%, brownish yellow (10YR 6/6), saturated	SC	
		5-6.5 ft	Sandy clay, 10-15% sand, white (7.5YR 8/0) 70%, light brown (7.5YR 6/4) 60%, red (10R 4/6) 20%, slightly moist to dry	CL	20+23
		10-11.5 ft	Sandy clay, 10-15% sand, white (10YR 8/1), saturated	CL	14+17
		15-16.5 ft	Sandy clay, 10% sand, white (10YR 8/1), saturated	CL	9+12
		20-21.5 ft	Sandy clay, 20% sand, white (10YR 8/1) 80%, brownish yellow (10YR 6/8) 20%, very moist	CL	4+8
		25-26.5 ft	Sandy clay, 20% sand, med to fine, white (10YR 8/1), saturated		9+10

SHEET 1 OF 1

Boring No.	L-3	Location Coordinates	351 475.70 N
			799 476.12 E
Hole Size	6 in. Slot 0.01 in.		
Screen Size	2 in. Mat'l Sch. 40 PVC	Filter Materials	20-30 Sand
Casing Size	2 in. Mat'l Sch. 40 PVC	Grout Type	Sand Cement
Geologist	J. Steinberg	Protective Casing	6-in. steel
Date Start	3/30/84 1400 Finish 3/31/84 1730	Static Water Level	
Contractor	WAR/WTD	Top of Well Elevation	218.60' msl
Driller	P. Wright	Drill Type	6-in. Hollow Stem Auger

Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
		Surface	Clayey sand, angular, med-fine, some organics, v. dk gray (5YR 3/1), saturated	SC	—
		5-6.5 ft	Clayey sand, fine-med, 60% sand, white (7.5YR 8/0), moist	SC	4+6
		10-11.5 ft	sandy clay, 40% sand, white (7.5 YR 8/0), reddish yellow tracers (7.5 YR 7/6), very moist	CL	14+16
		15-16.5 ft	Clayey sand, 70-80% sand, regular, angular to subangular, medium to fine, white (7.5 YR 8/0)	SC	12+17
		20-21.5 ft	Clayey sand, 60-70% sand, well sorted, subrounded, medium-fine, white (7.5 YR 8/0) with strong brown (7.5 YR 5/8) bands (≈20%) very moist-saturated	SC	5+5
		25-26.5 ft	sandy clay, 10% sand, reddish yellow (7.5 YR 6/8) with white streaks (<5%	CL	6+7

Boring No. L-4

Location Coordinates 356 049.96 N 860 469.46 E

Hole Size 6 in. Slot 0.01 in.

Screen Size 2 in. Mat'l Sch. 40 PVC

Filter Materials 20-30 Sand

Casing Size 2 in. Mat'l Sch. 40 PVC

Grout Type Sand Cement

Geologist J. Steinberg

Protective Casing 6-in. steel

Date Start 3/31/84 0820 Finish 3/31/84 1545

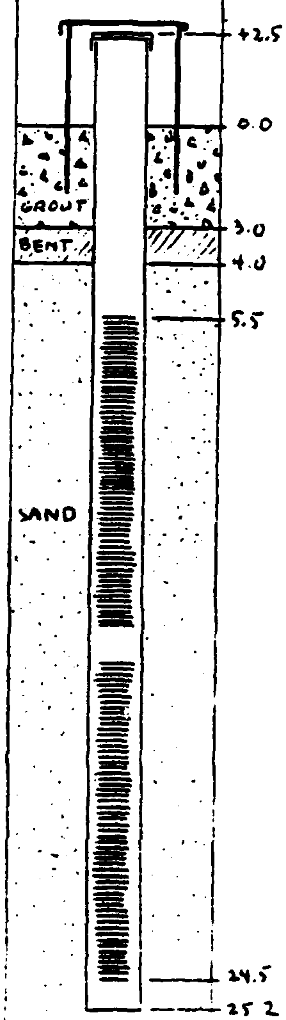
Static Water Level

Contractor WAR/WTD

Top of Well Flevation 222.22 ' msl

Driller P. Wright

Drill Type 6-in. Hollow Stem Auger

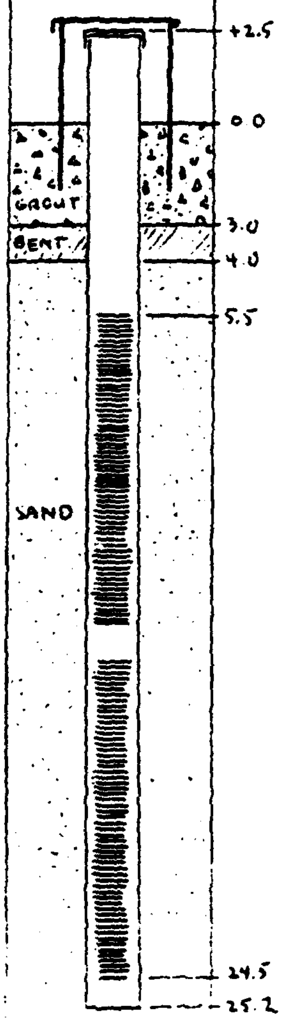


Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
		Surface	Clayey sand, 60% sand, poorly sorted, medium to fine, subangular to subrounded, saturated, brown (7.5 YR 5/4)	SC	—
		5-6.5 ft	Sandy clay (70%) mixed with clayey sand (30%), 60-70% sand, clay 10-15%, clayey sand white (7.5 YR 8/0), sandy clay strong brown (7.5 YR 5/6) 50% and red (10R 4/6) 50%, moist, sand subangular, fine, well sorted.	CL-SC	12+13
		10-11.5 ft	Sandy clay, 30% sand, v. fine, white (10 YR 8/1), moist	CL	11+10
		15-16.5 ft	Sandy clay, 30% sand, v. fine, white (10 YR 8/1), moist	CL	12+15
		20-21.5 ft	Sandy clay, 30% sand, very fine, white (7.5 YR 8/0) 10%, strong brown (7.5 YR 5/8) 20%, red (10 YR 5/6) 50%, and pale red (7.5 YR 6/4) 20% moist	CL	7+11
		25-26.5 ft	Clayey sand, 30% sand, saturated, subangular, poorly sorted, fine to very fine, v. pale brown (10 YR 7/3)	CL	3+2
			NOTE: sand in lower 6" of base, above more clay (brown then red)		

SHEET 1 OF 1

Boring No. L-5
Hole Size 6 in. Slot 0.01 in.
Screen Size 2 in. Mat'l Sch. 40 PVC
Casing Size 2 in. Mat'l Sch. 40 PVC
Geologist J. Steinberg
Date Start 3/31/84 1038 Finish 3/31/84 1550
Contractor WAR/WTD
Driller P. Wright

Location Coordinates 350 308.52 N
799 496.38 E
Filter Materials 20-30 Sand
Grout Type Sand Cement
Protective Casing 6-in. steel
Static Water Level
Top of Well Elevation 227.53' msl
Drill Type 6-in. Hollow Stem Auger



Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
		surface	clayey sand, 60% sand, medium to fine, well sorted, subangular, yellowish brown (10YR 5/6), moist	SC	—
		5-6.5 ft	sandy clay, 30-40% sand, fine, white (10YR 8/1) 90%, with brownish yellow (10YR 6/6) 10%, moist	CL	14+15
		10-11.5 ft	sandy clay, 30-40% sand, fine, white (10YR 8/1) 50%, red (10R 4/3) 30%, and reddish yellow (7.5YR 6/6) 20%, moist	CL	9+11
		15-16.5 ft	sandy clay, 20% sand, angular, fine, white (10YR 8/1), moist	CL	11+14
		20-21.5 ft	sandy clay, 45-50% sand, subangular, fine, yellow (10YR 7/6) 50%, brownish yellow (10YR 6/6) 40%, and white (10YR 8/1) 10%, saturated	CL	4+7
		25-26.5 ft	clayey sand in 2" layers with sandy clay alternate layers, 3 sand layers in spoon, sand - 50% sand, fine, poorly sorted, white (10YR 8/1), saturated. clay - 40-50% sand, brownish yellow (10YR 6/6) 60%, and dark yellowish brown (10YR 4/4) 40%, saturated	SC - CL	8+14

SHEET 1 OF 1

Boring No. L-6

Hole Size 6 in. Slot 0.01 in.

Screen Size 2 in. Mat'l Sch. 40 PVC

Casing Size 2 in. Mat'l Sch. 40 PVC

Geologist J. Steinberg

Date Start 3/31/84 1314 Finish 3/31/84 1720

Contractor WAR/WTD

Driller P. Wright

Location Coordinates 350 907.59 N
797 390.26 E

Filter Materials 20-30 Sand

Grout Type Sand Cement

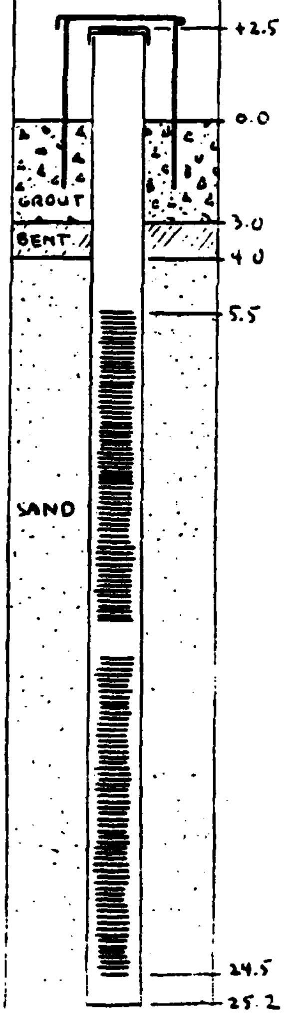
Protective Casing 6-in. steel

Static Water Level

Top of Well Elevation 237.47 ' msl

Drill Type 6-in. Hollow Stem Auger

Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
		surface	Sandy clay, 30% sand, v. fine, subrounded, yellowish brown (10YR 5/6) 60% and dark gray (10YR 4/1) 45%, moist	CL	—
		5-6.5 ft	sandy clay, 20% sand, v fine, subangular, white (10YR 8/1) 70%, red (10R 4/8) 20%, yellow (10YR 7/8) 10%, moist	CL	9+11
		10-11.5 ft	sandy clay, 20% sand, v. fine, subangular, white (10YR 8/1) with yellow streak (10YR 7/8), moist	CL	10+13
		15-16.5 ft	sandy clay, 20-30% sand, v. fine, well sorted, subangular, white (5YR 8/1) with red streak (2.5YR 5/8), moist	CL	12+17
		20-21.5 ft	Sandy clay, 20% sand, v. fine, well sorted, subangular, white (10YR 8/1) 70%, v. dusky red (10R 2.5/2) 20%, yellow (10YR 7/8) 10%, moist		
		25-26.5 ft	Sandy clay, 30-40% sand, fine, poorly graded, subangular, white (10YR 8/1) [illegible], moist		



SUMMARY OF FREE JP-4 PRODUCT SURVEYS[a]
TEMPORARY WELLPOINT INSTALLATIONS--SITE 2

Date	Wellpoint No.	Product Thickness (ft)[b]	Odor	Color	Remarks
11-19-86	1	0	Light	Milky	--
	2	0	Very Light	Milky	--
	3	0	Very Light	Milky	--
	4	0	Very Light	Clear	--
	5	0.01	Heavy	Tannish	Appeared as Emulsified JP-4
	6	0	None	Clear	--
	7	0	None	Clear	--
11-20-86	1	0	Light	Clear	--
	2	0	Very Light	Clear	--
	3	0	Very Light	Clear	--
	4	0	None	Clear	--
	5	<0.01	Heavy	Tannish	Thin Sheen of Emulsified JP-4
	6	0	None	Clear	--
	7	0	None	Clear	--
11-24-86	1	0	Light	Clear	--
	2	0	Very Light	Clear	Very Thin Sheen
	3	0	Very Light	Clear	--
	4	0	None	Clear	--
	5	Trace	Heavy	Tannish	Very Thin Sheen of Emulsified JP-4
	6	0	None	Clear	--
	7	0	None	Clear	--

[a]All measurements taken by CH2M HILL.

[b]Using clear Teflon® bailer.

SUMMARY OF ORGANIC VAPOR LEVELS[a]
TEMPORARY WELLPOINT INSTALLATIONS--SITE 2

Wellpoint No.	Organic Vapor Readings (PPM)[b] 11-19-86[c] Background	Well	11-19-86[d] Background	Well	11-20-86[e] Background	Well	11-24-86[f] Background	Well
1	1.0	2-3	0.6	2-3	0.2	100	0	75-80
2	0.6	6-8	0.6	1-2	0.2	20	0	24
3	0.6	<1	0.7	<1	0.2	18	0	15
4	0.6	1-2	0.7	<1	0.4	15	<1	1-2
5	0.6	4-7	0.7	2-3	0.4	120	0	30-40
6	0.5	<1	0.8	<1	0.2	0.8[g]	0	<1
7	0.6	1-3	0.8	1-2	0.2	22	0	1-2

[a]All measurements taken by CH2M HILL a minimum of 24 hours following wellpoint installation.

[b]All readings taken with HNU® organic vapor analyzer.

[c]Readings taken with caps off and probe about 2 inches into well casing.

[d]Readings taken after about 30 to 45 minutes of venting with HNU® sealing well casing.

[e]Readings taken with caps off and probe through plastic bag installed to seal well casing, after about 26 hours from previous measurement.

[f]Readings taken with caps off and probe through plastic bag installed to seal well casing, after about 88 hours from previous measurement.

[g]Plastic bag used for sealing well casing punctured and open to atmosphere.

gnR301B/003-1

PART I--FIELD DATA SUMMARY
Water Quality Sampling December 1986[a]
MOODY AFB, GEORGIA

Site No.	Sample Designation	Type of Sample	Approx. Well Depth (ft)	Depth to Water[b]: Pre-Purge Date	Pre-Purge Time	Pre-Purge Level	At Sampling Date	At Sampling Time	At Sampling Level	Stabilized[d] Date	Stabilized Time	Stabilized Level	Pre-Sample Purging[c]: Approx. Duration (min)	Est. Volume (gal)
1	ML-1	Groundwater	26.5	12-2-86	1700	11.28	12-3-86	0824	11.08	1-12-87	1351	3.31	15	5
1	ML-2	Groundwater	26.5	12-4-86	0850	11.89	12-4-86	0930	--	1-12-87	0938	3.79	15	7
1	ML-7S	Groundwater	30	12-2-86	1550	12.40	12-3-86	1348	12.06	1-12-87	1050	4.49	10	4
1	ML-8S	Groundwater	30	12-2-86	1445	9.43	12-3-86	1524	9.29	1-12-87	1037	5.12	10	4
1	ML-9S	Groundwater	30	12-2-86	1515	7.12	12-3-86	1430	7.04	1-12-87	1040	3.90	10	4
1	ML-10S	Groundwater	30	12-4-86	0956	9.63	12-5-86	0825	9.57	1-12-87	1132	5.68	10	4
1	ML-11S	Groundwater	30	12-3-86	1638	11.86	12-3-86	1700	--	1-12-87	1117	6.40	10	10
1	ML-12S	Groundwater	30	12-3-86	1612	12.26	12-4-86	1025	12.22	1-12-87	1104	5.72	15	3
1	ML-13D	Groundwater	80	12-4-86	1515	--	12-5-86	0950	27.86	1-12-87	1126	24.60	30	30
1	ML-14D	Groundwater	80	12-4-86	1350	27.57	12-4-86	1435	--	1-12-87	1112	23.82	25	25
1	ML-15D	Groundwater	80	12-2-86	1705	25.72	12-3-86	0830	--	1-12-87	1058	22.02	15	9
1	MLSW-7	Groundwater	195	--	--	--	--	--	--				30	<150
2	MUS-1	Groundwater	30	12-2-86	1247	10.06	12-3-86	1015	9.49	1-13-87	1027	8.66	15	3.2
2	MUS-2	Groundwater	30	12-2-86	1234	9.13	12-3-86	1020	9.96	1-12-87	1017	7.33	15	3.4
2	MUS-3	Groundwater	30	12-2-86	1228	10.25	12-3-86	1023	9.54	1-12-87	1007	7.73	15	3.2
2	MUS-4	Groundwater	30	12-2-86	1254	9.54	12-3-86	1104	9.75	1-12-87	1012	7.68	15	3.3
3	MFSW-1	Surface Water	--	--	--	--	12-1-86	1400	--				--	--
3	MFSW-2	Surface Water	--	--	--	--	12-1-86	1530	--				--	--
3	MFSW-3	Surface Water	--	--	--	--	12-2-86	0915	--				--	--
3	MFSW-4	Surface Water	--	--	--	--	12-2-86	1000	--				--	--
3	MFSW-5	Surface Water	--	--	--	--	12-2-86	1045	--				--	--
3	MFSD-1	Sediment	--	--	--	--	12-1-86	1400	--				--	--
3	MFSD-2	Sediment	--	--	--	--	12-1-86	1530	--				--	--
3	MFSD-3	Sediment	--	--	--	--	12-2-86	0915	--				--	--
3	MFSD-4	Sediment	--	--	--	--	12-2-86	1000	--				--	--
3	MFSD-5	Sediment	--	--	--	--	12-2-86	1045	--				--	--
4	MGSW-10	Groundwater	--	--	--	--	--	--	--				210	6,300

[a]Sampling performed by CH2M HILL personnel. Refer to Parts II and III for additional information.

[b]Measurements from top of casing (north side) by CH2M HILL.

[c]Performed by CH2M HILL using a hand pump.

[d]Measurements prior to in-situ well testing.

PART II--FIELD DATA SUMMARY
WATER QUALITY SAMPLING, DECEMBER 1986[a]
MOODY AFB, GEORGIA

Site No.	Sample Designation	Type of Sample	Date	Final Water Quality Characteristics[b] Time	PH (S.U.)	Temp. (°C)	Conductivity (MHOS)	Odor	Color
1	ML-1	Groundwater	12-2-86	1726	4.5	19	30	None	Clear
1	ML-2	Groundwater	12-4-86	0919	--	19	200	Glue odor	Milky orange
1	ML-7S	Groundwater	12-2-86	1612	5.0	22	45	None	Clear
1	ML-8S	Groundwater	12-2-86	1504	5.5	20	70	None	Clear
1	ML-9S	Groundwater	12-2-86	1533	6.4	23	80	None	Clear
1	ML-10S	Groundwater	12-4-86	1003	5.4	18	180	None	Light orange
1	ML-11S	Groundwater	12-3-86	1645	4.6	19	25	None	Clear
1	ML-12S	Groundwater	12-3-86	1624	4.3	19	20	None	Turbid orange
1	ML-13D	Groundwater	12-5-86	1022	5.1	19	45	None	Light Orange
1	ML-14D	Groundwater	12-4-86	1346	8.4	18	125	None	Turbid orange
1	ML-15D	Groundwater	12-2-86	1722	11.2	20	3,350	None	Turbid orange
1	MLSW-7	Groundwater	--	--	--	--	--	None	Clear
2	MUS-1	Groundwater	12-2-86	1355	5.9	23	600	None	Milky orange
2	MUS-2	Groundwater	12-2-86	1345	5.5	20	290	None	Milky orange
2	MUS-3	Groundwater	12-2-86	1328	5.2	22	140	None	Milky orange
2	MUS-4	Groundwater	12-2-86	1411	5.5	22	370	None	Milky orange
3	MFSW-1	Surface Water	--	--	--	--	--	None	Light sheen, see remarks
3	MFSW-2	Surface Water	--	--	--	--	--	None	Light sheen, see remarks
3	MFSW-3	Surface Water	--	--	--	--	--	None	Light sheen, see remarks
3	MFSW-4	Surface Water	--	--	--	--	--	None	Light sheen, see remarks
3	MFSW-5	Surface Water	--	--	--	--	--	None	Light sheen, see remarks
3	MFSD-1	Sediment	--	--	--	--	--	Light	Clear, white sand
3	MFSD-2	Sediment	--	--	--	--	--	Light	Dark organic sediment
3	MFSD-3	Sediment	--	--	--	--	--	Light	Gray clay
3	MFSD-4	Sediment	--	--	--	--	--	Strong	Black sediment
3	MFSD-5	Sediment	--	--	--	--	--	Medium	White sand and organics
4	MGSW-10	Groundwater	--	--	--	--	--	None	Clear

[a]Sampling performed by CH2M HILL. Refer to Part III for additional remarks.

[b]Prior to obtaining samples.

PART III--FIELD DATA SUMMARY
WATER QUALITY SAMPLING, DECEMBER 1986[a]
MOODY AFB, GEORGIA

Site No.	Sample Designation	Type of Sample	Remarks[b]
1	ML-1	Groundwater	Existing well. Purged dry; partial overnight recharge.
1	ML-2	Groundwater	Existing well. Cloudy. pH not available (meter inoperable). WL at sampling not taken.[c]
1	ML-7S	Groundwater	New shallow well. Purged dry; partial overnight recharge.
1	ML-8S	Groundwater	New shallow well. Purged dry; partial overnight recharge.
1	ML-9S	Groundwater	New shallow well. Purged dry; partial overnight recharge.
1	ML-10S	Groundwater	New shallow well. Purged dry; partial overnight recharge.
1	ML-11S	Groundwater	New shallow well. WL at sampling not taken.[c]
1	ML-12S	Groundwater	New shallow well. Purged dry; partial overnight recharge.
1	ML-13D	Groundwater	New deep well. WL at pre-purge not available (rag in well from construction; blocked well above water table). Rag removed at purging.
1	ML-14D	Groundwater	New deep well. WL at sampling not taken.[c] Initial pH and conductivity very high, but decrease after purging.[d]
1	ML-15D	Groundwater	New deep well. Purged dry; partial overnight recharge. WL at sampling not taken.[c] High pH and conductivity[d]
2	MUS-1	Groundwater	New well; purged dry; partial overnight recharge.
2	MUS-2	Groundwater	New well; purged dry; partial overnight recharge.
2	MUS-3	Groundwater	New well; purged dry; partial overnight recharge.
2	MUS-4	Groundwater	New well; purged dry; partial overnight recharge.
3	MFSW-1	Surface Water[e]	Floating sheen at location. Hydrocarbon sheens released upon disturbing sediments.
3	MFSW-2	Surface Water	Same as above.
3	MFSW-3	Surface Water	Same as above.
3	MFSW-4	Surface Water	Same as above.
3	MFSW-5	Surface Water	Same as above.
3	MFSD-1	Sediment[e]	Top six inches of sediment sampled.
3	MFSD-2	Sediment	Same as above.
3	MFSD-3	Sediment	Same as above.
3	MFSD-4	Sediment	Top six inches of sediment sampled. Black hydrocarbon-saturated sediment.
3	MFSD-5	Sediment	Top six inches of sediment sampled.

[a]Sampling performed by CH2M HILL personnel pursuant to approved Technical Operations Plan.

[b]For wells purged dry, VOA's and metals filled first with clear water from bailer. Samples for other parameters may have contained fine suspended particles.

[c]Good recharge.

[d]Likely due to residual drilling mud and grout being further developed out.

[e]Heavy rains during Site 3 sampling. pH meter drifting from baseline (probably weather related). Conductivity and temperature not taken.

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PROJECT NO. GN21222.CO

CH2M

PUMPING TEST REPORT

WELL MU-1 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 225.44

PUMPING RATES Slug In

PUMP ON: DATE 1/12/87 TIME 17:25

HOW Q MEASURED ______

PUMP OFF: DATE 1/12/87 TIME 17:47

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/STOPPED (MINUTES)	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				8.66	0		Static Condition
0					2.38		Change in Water Level, Slug Insta
12 secs					2.17		" " " "
24 secs					2.11		" " " "
37 secs					2.05		" " " "
47 secs					2.01		" " " "
1 min 2 sec					1.95		" " " "
1 m 32 s					1.85		" " " "
2 m 2 s					1.75		" " " "
2 m 27 s					1.68		" " " "
2 m 57 s					1.60		" " " "
3 m 27 s					1.53		" " " "
3 m 57 s					1.45		" " " "
4 m 27 s					1.39		" " " "
4 m 57 s					1.32		" " " "
5 m 27 s					1.27		" " " "
5 m 57 s					1.21		" " " "
6 m 27 s					1.16		" " " "
6 m 57 s					1.12		" " " "
7 m 27 s					1.08		" " " "
7 m 57 s					1.04		" " " "
8 m 27 s					1.00		" " " "
8 m 57 s					0.97		" " " "

FOR

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C

WELL MU-1 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 225.44

PUMPING RATES Slug In

PUMP ON: DATE 1/12/87 TIME 17:25

HOW Q MEASURED ______

PUMP OFF: DATE 1/12/87 TIME 17:47

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
9 min 27	secs				0.94		Change in Water Level
9 m 57 s					0.91		" " " "
10 m 27 s					0.89		" " " "
10 m 57 s					0.87		" " " "
11 m 27 s					0.85		" " " "
11 m 57 s					0.83		" " " "
12 m 27 s					0.81		" " " "
13 m 27 s					0.78		" " " "
14 m 27 s					0.75		" " " "
15 m 27 s					0.73		" " " "
16 m 27 s					0.71		" " " "
17 m 27 s					0.69		" " " "
18 m 27 s					0.68		" " " "
19 m 27 s					0.67		" " " "
20 m 27 s					0.66		" " " "
21 m 27 s					0.65		End Slug Test

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PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL MU-1 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. RADIUS 1" M.P. FOR WL's T.O.C. EL 225.44

PUMPING RATES Slug Out PUMP ON: DATE 1/12/87 TIME 17:51

HOW Q MEASURED PUMP OFF: DATE 1/12/87 TIME 18:13

HOW WL's MEASURED Transducer COMMENTS

DISTANCE FROM PUMPED WELL

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				8.66	0		Static Condition
0					2.16		Change in Water Level, Slug Remov
12 secs					1.98		" " " "
24 secs					1.90		" " " "
36 secs					1.84		" " " "
46 secs					1.80		" " " "
1 min 1 sec					1.75		" " " "
1 m 31 s					1.64		" " " "
2 m 1 s					1.55		" " " "
2 m 31 s					1.45		" " " "
3 m 1 s					1.38		" " " "
3 m 31 s					1.31		" " " "
4 m 1 s					1.24		" " " "
4 m 31 s					1.17		" " " "
5 m 1 s					1.11		" " " "
5 m 31 s					1.05		" " " "
6 m 1 s					1.00		" " " "
6 m 31 s					0.94		" " " "
7 m 1 s					0.90		" " " "
7 m 31 s					0.85		" " " "
8 m 1 s					0.81		" " " "
8 m 31 s					0.77		" " " "
9 m 1 s					0.73		" " " "

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FOR

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PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL MU-1 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 225.44

PUMPING RATES Slug Out PUMP ON: DATE 1/12/87 TIME 17:51

HOW Q MEASURED ______ PUMP OFF: DATE 1/12/87 TIME 18:13

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
9 min 31 secs					0.69		Change in Water Level
10 m 1 s					0.66		" " " "
10 m 31 s					0.62		" " " "
11 m 1 s					0.59		" " " "
11 m 31 s					0.56		" " " "
12 m 1 s					0.53		" " " "
12 m 31 s					0.51		" " " "
13 m 31 s					0.46		" " " "
14 m 31 s					0.41		" " " "
15 m 31 s					0.37		" " " "
16 m 31 s					0.34		" " " "
17 m 31 s					0.30		" " " "
18 m 31 s					0.28		" " " "
19 m 31 s					0.25		" " " "
20 m 31 s					0.23		" " " "
21 m 31 s					0.21		End Slug Test

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PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL MU-3 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ____ RADIUS 1" M.P. FOR WL's T.O.C. EL 225.68

PUMPING RATES Slug In PUMP ON: DATE 1/12/87 TIME 15:04

HOW Q MEASURED ____ PUMP OFF: DATE 1/12/87 TIME 15:26

HOW WL's MEASURED Transducer COMMENTS ____

DISTANCE FROM PUMPED WELL ____

TIME SINCE PUMPING START/STOPPED (MINUTES)	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				7.73	0		Static Condition
0					2.47		Change in Water Level, Slug Instal
12 secs					1.50		" " " "
24 secs					1.41		" " " "
34 secs					1.27		" " " "
49 secs					1.10		" " " "
59 secs					1.00		" " " "
1 min 30	secs				0.75		" " " "
2 min					0.57		" " " "
2 m 30 s					0.43		" " " "
3 min					0.33		" " " "
3 m 30 s					0.25		" " " "
4 min					0.20		" " " "
4 m 30 s					0.15		" " " "
5 min					0.12		" " " "
5 m 30 s					0.10		" " " "
6 min					0.08		" " " "
6 m 30 s					0.06		" " " "
7 min					0.05		" " " "
8 min					0.03		" " " "
9 min					0.02		" " " "
10 min					0.01		" " " "
11 min					0.01		End Slug Test

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PROJECT NO. GN21222.CO

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PUMPING TEST REPORT

WELL MU-3 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 225.68

PUMPING RATES Slug Out PUMP ON: DATE 1/12/87 TIME 15:28

HOW Q MEASURED ______ PUMP OFF: DATE 1/12/87 TIME 15:50

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				7.73	0		Static Condition
0					2.09		Change in Water Level, Slug Remove
12 secs					1.85		" " " "
24 secs					1.72		" " " "
34 secs					1.63		" " " "
49 secs					1.52		" " " "
59 secs					1.46		" " " "
1 min 30 secs					1.31		" " " "
2 min					1.16		" " " "
2 m 30 s					1.03		" " " "
3 min					0.93		" " " "
3 m 30 s					0.83		" " " "
4 min					0.74		" " " "
4 m 30 s					0.66		" " " "
5 min					0.59		" " " "
5 m 30 s					0.53		" " " "
6 min					0.47		" " " "
6 m 30 s					0.42		" " " "
7 min					0.38		" " " "
7 m 30 s					0.34		" " " "
8 min					0.30		" " " "
8 m 30 s					0.27		" " " "
9 min					0.24		" " " "

FORM

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL MU-3 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 225.68

PUMPING RATES Slug Out PUMP ON: DATE 1/12/87 TIME 15:28

HOW Q MEASURED ______ PUMP OFF: DATE 1/12/87 TIME 15:50

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
10 min					0.18		Change in Water Level
11 min					0.14		" " " "
12 min					0.11		" " " "
13 m 30 s					0.07		" " " "
15 m 30 s					0.04		" " " "
17 m 30 s					0.02		" " " "
19 m 30 s					0.01		" " " "
21 m 30 s					0.00		End Slug Test

FORI

PROJECT NO. GN21222.CO

PUMPING TEST REPORT

WELL MU-4 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ____ RADIUS 1"

M.P. FOR WL's T.O.C. EL 226.04

PUMPING RATES Slug In

PUMP ON: DATE 1/12/87 TIME 16:23

HOW Q MEASURED ____

PUMP OFF: DATE 1/12/87 TIME 16:45

HOW WL's MEASURED Transducer

COMMENTS ____

DISTANCE FROM PUMPED WELL ____

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				7.68	0		Static Condition
0					2.12		Change in Water Level, Slug Install
12 secs					1.88		" " " "
24 secs					1.74		" " " "
35 secs					1.64		" " " "
45 secs					1.57		" " " "
1 min					1.54		" " " "
1 m 30 s					1.38		" " " "
2 min					1.25		" " " "
2 m 30 s					1.13		" " " "
3 m 10 s					1.00		" " " "
3 m 40 s					0.91		" " " "
4 m 10 s					0.83		" " " "
4 m 40 s					0.76		" " " "
5 m 10 s					0.70		" " " "
5 m 40 s					0.65		" " " "
6 m 10 s					0.61		" " " "
6 m 40 s					0.56		" " " "
7 m 10 s					0.53		" " " "
7 m 40 s					0.50		" " " "
8 m 10 s					0.47		" " " "
8 m 40 s					0.44		" " " "
9 m 10 s					0.41		" " " "

FORM :

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL MU-4 PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 226.04

PUMPING RATES Slug In

PUMP ON: DATE 1/12/87 TIME 16:23

HOW Q MEASURED ______

PUMP OFF: DATE 1/12/87 TIME 16:45

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/STOPPED (MINUTES	t/t'	WATER LEVEL				ADJUSTED DRAW-DOWN (ft)	REMARKS
		READINGS		DEPTH TO WATER (ft)	DRAW-DOWN (ft)		
		REFERENCE	MEASURE				
9 min 40	sec				0.39		Change in Water Level
10 m 10 s					0.37		" " " "
10 m 40 s					0.36		" " " "
11 m 10 s					0.34		" " " "
11 m 40 s					0.33		" " " "
12 m 10 s					0.32		" " " "
12 m 40 s					0.31		" " " "
13 m 40 s					0.29		" " " "
14 m 40 s					0.27		" " " "
15 m 40 s					0.26		" " " "
16 m 40 s					0.25		" " " "
17 m 40 s					0.24		" " " "
18 m 40 s					0.23		" " " "
19 m 40 s					0.22		End Slug Test

FORM

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL MU-4 PUMPING/OBSERVATION WELL
TYPE OF DATA DRAWDOWN/RECOVERY Slug Test
PUMPED WELL NO. ____ RADIUS 1"
M.P. FOR WL's T.O.C. EL 226.04
PUMPING RATES Slug Out
PUMP ON: DATE 1/12/87 TIME 16:47
HOW Q MEASURED ____
PUMP OFF: DATE 1/12/87 TIME 17:09
HOW WL's MEASURED Transducer
COMMENTS ____
DISTANCE FROM PUMPED WELL ____

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				7.68	0		Static Condition
0					2.04		Change in Water Level, Slug Removed
12 secs					1.75		" " " "
24 secs					1.62		" " " "
35 secs					1.53		" " " "
45 secs					1.45		" " " "
1 min					1.35		" " " "
1 m 30 s					1.18		" " " "
2 min					1.03		" " " "
2 m 30 s					0.90		" " " "
3 min					0.79		" " " "
3 m 30 s					0.69		" " " "
4 min					0.61		" " " "
4 m 30 s					0.54		" " " "
5 min					0.48		" " " "
5 m 30 s					0.42		" " " "
6 min					0.38		" " " "
6 m 30 s					0.34		" " " "
7 min					0.30		" " " "
7 m 30 s					0.27		" " " "
8 min					0.24		" " " "
8 m 30 s					0.21		" " " "
9 min					0.19		" " " "

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL MU-4 PUMPING/OBSERVATION WELL
TYPE OF DATA DRAWDOWN/RECOVERY Slug Test
PUMPED WELL NO. ____ RADIUS 1" M.P. FOR WL's T.O.C. EL 226.04
PUMPING RATES Slug Out PUMP ON: DATE 1/12/87 TIME 16:47
HOW Q MEASURED ____ PUMP OFF: DATE 1/12/87 TIME 17:09
HOW WL's MEASURED Transducer COMMENTS ____
DISTANCE FROM PUMPED WELL ____

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
9 min 30 sec					0.17		Change in Water Level
10 min					0.16		" " " "
10 m 30 s					0.14		" " " "
11 min					0.13		" " " "
11 m 30 s					0.12		" " " "
12 min					0.11		" " " "
12 m 30 s					0.10		" " " "
13 m 30 s					0.09		" " " "
14 m 30 s					0.08		" " " "
15 m 30 s					0.07		" " " "
16 m 30 s					0.06		" " " "
17 m 30 s					0.05		" " " "
18 m 30 s					0.05		" " " "
19 m 30 s					0.05		" " " "
20 m 30 s					0.05		" " " "
21 m 30 s					0.04		End Slug Test

FORM 36?

PROJECT NO. GN21222.CO

PUMPING TEST REPORT

WELL L-8-S PUMPING/OBSERVATION WELL
TYPE OF DATA DRAWDOWN/RECOVERY Slug Test
PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 222.77
PUMPING RATES Slug In PUMP ON: DATE 1/13/87 TIME 8:06
HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 8:28
HOW WL's MEASURED Transducer COMMENTS ______
DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				5.18	0		Static Condition
0					1.64		Change in Water Level, Slug Installed
7 secs					1.56		" " " "
12 secs					1.50		" " " "
24 secs					1.37		" " " "
35 secs					1.27		" " " "
50 secs					1.15		" " " "
1 min					1.08		" " " "
1 m 30 s					0.88		" " " "
2 min					0.73		" " " "
2 m 30 s					0.59		" " " "
3 m 5 s					0.45		" " " "
3 m 35 s					0.35		" " " "
4 m 5 s					0.27		" " " "
4 m 35 s					0.20		" " " "
5 m 5 s					0.13		" " " "
5 m 35 s					0.08		" " " "
6 m 5 s					0.03		" " " "
6 m 35 s					0.01		End Slug Test

PROJECT NO. GN21222.CO

CH2M

PUMPING TEST REPORT

WELL L-8-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 222.77

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 8:31

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 8:53

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	WATER LEVEL DEPTH TO WATER (ft)	WATER LEVEL DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				5.18	0		Static Condition
0					1.98		Change in Water Level, Slug Removed
12 secs					1.81		" " " "
24 secs					1.75		" " " "
36 secs					1.70		" " " "
49 secs					1.65		" " " "
59 secs					1.61		" " " "
1 m 29 s					1.51		" " " "
1 m 59 s					1.42		" " " "
2 m 29 s					1.33		" " " "
2 m 34 s					1.32		" " " "
2 m 39 s					1.31		" " " "
3 m 9 s					1.23		" " " "
3 m 39 s					1.16		" " " "
4 m 9 s					1.09		" " " "
4 m 39 s					1.02		" " " "
5 m 9 s					0.96		" " " "
5 m 39 s					0.91		" " " "
6 m 9 s					0.85		" " " "
6 m 39 s					0.80		" " " "
7 m 9 s					0.76		" " " "
7 m 39 s					0.71		" " " "
8 m 9 s					0.67		" " " "

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-8-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 222.77

PUMPING RATES Slug Out PUMP ON: DATE 1/13/87 TIME 8:06

HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 8:28

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
8 min 39	sec				0.63		Change in Water Level
9 m 9 s					0.60		" " " "
9 m 39 s					0.56		" " " "
10 m 9 s					0.53		" " " "
10 m 39 s					0.50		" " " "
11 m 9 s					0.47		" " " "
11 m 39 s					0.44		" " " "
12 m 9 s					0.42		" " " "
12 m 39 s					0.39		" " " "
13 m 39 s					0.35		" " " "
14 m 39 s					0.31		" " " "
15 m 39 s					0.28		" " " "
16 m 39 s					0.25		" " " "
17 m 39 s					0.22		" " " "
18 m 39 s					0.20		" " " "
19 m 39 s					0.18		" " " "
20 m 39 s					0.16		" " " "
21 m 39 s					0.15		End Slug Test

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PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-10-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 220.40

PUMPING RATES Slug In PUMP ON: DATE 1/13/87 TIME 9:28

HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 9:43

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/STOPPED (MINUTES)	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				5.76	0		Static Conditions
0					2.44		Change in Water Level, Slug Installed
12 secs					1.44		" " " "
24 secs					1.34		" " " "
36 secs					1.26		" " " "
48 secs					1.19		" " " "
1 min 3	sec				1.12		" " " "
1 m 33 s					1.02		" " " "
2 m 3 s					0.92		" " " "
2 m 33 s					0.84		" " " "
3 m 8 s					0.76		" " " "
3 m 38 s					0.69		" " " "
4 m 38 s					0.58		" " " "
5 m 38 s					0.48		" " " "
6 m 38 s					0.40		" " " "
7 m 8 s					0.36		" " " "
8 m 8 s					0.30		" " " "
9 m 8 s					0.24		" " " "
10 m 8 s					0.18		" " " "
11 m 8 s					0.14		" " " "
12 m 8 s					0.09		" " " "
12 m 38 s					0.08		" " " "
14 m 38 s					0.01		End Slug Test

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-10-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 220.40

PUMPING RATES Slug Out PUMP ON: DATE 1/13/87 TIME 9:57

HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 10:16

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				5.90	0		Static Condition
0					1.94		Change in Water Level, Slug Removed
12 secs					1.68		" " " "
24 secs					1.58		" " " "
36 secs					1.52		" " " "
48 secs					1.47		" " " "
58 secs					1.44		" " " "
1 min 28	sec				1.34		" " " "
1 m 58 s					1.26		" " " "
2 m 28 s					1.19		" " " "
3 m 8 s					1.10		" " " "
3 m 38 s					1.04		" " " "
4 m 8 s					0.98		" " " "
4 m 38 s					0.93		" " " "
5 m 8 s					0.88		" " " "
5 m 38 s					0.84		" " " "
6 m 8 s					0.79		" " " "
6 m 38 s					0.75		" " " "
7 m 8 s					0.72		" " " "
8 m 8 s					0.65		" " " "
9 m 8 s					0.59		" " " "
10 m 8 s					0.54		" " " "
11 m 8 s					0.50		" " " "

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL L-10-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 220.40

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 9:57

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 10:16

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
12 min 8	sec				0.45		Change in Water Level
12 m 38	s				0.44		" " " "
14 m 38	s				0.37		" " " "
16 m 38	s				0.33		" " " "
18 m 38	s				0.30		End Slug Test

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-11-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 222.31

PUMPING RATES Slug In PUMP ON: DATE 1/13/87 TIME 10:43

HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 10:55

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				6.50	0		Static Condition
0					2.44		Change in Water Level, Slug Installed
12 secs					1.80		" " " "
24 secs					1.71		" " " "
36 secs					1.64		" " " "
47 secs					1.57		" " " "
1 min 2 sec					1.49		" " " "
1 m 32 s					1.33		" " " "
2 m 2 s					1.20		" " " "
2 m 32 s					1.07		" " " "
3 m 7 s					0.94		" " " "
3 m 37 s					0.84		" " " "
4 m 7 s					0.75		" " " "
4 m 37 s					0.67		" " " "
5 m 7 s					0.59		" " " "
5 m 37 s					0.52		" " " "
6 m 7 s					0.46		" " " "
6 m 37 s					0.39		" " " "
7 m 7 s					0.34		" " " "
7 m 37 s					0.29		" " " "
8 m 7 s					0.24		" " " "
8 m 37 s					0.19		" " " "
9 m 7 s					0.15		" " " "

FORM 362

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL L-11-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. RADIUS 1"

M.P. FOR WL's T.O.C. EL 222.31

PUMPING RATES Slug In

PUMP ON: DATE 1/13/87 TIME 10:43

HOW Q MEASURED

PUMP OFF: DATE 1/13/87 TIME 10:55

HOW WL's MEASURED Transducer

COMMENTS

DISTANCE FROM PUMPED WELL

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL				ADJUSTED DRAW-DOWN (ft)	REMARKS
		READINGS		DEPTH TO WATER (ft)	DRAW-DOWN (ft)		
		REFERENCE	MEASURE				
9 min 37	sec				0.11		Change in Water Level
10 m 7 s					0.08		" " " "
10 m 37 s					0.05		" " " "
11 m 7 s					0.02		" " " "
11 m 37 s					0.01		End Slug Test

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL L-11-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 222.31

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 11:10

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 11:31

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				6.74	0		Static Conditions
0					2.04		Change in Water Level, Slug Removed
12 secs					1.91		" " " "
24 secs					1.85		" " " "
36 secs					1.81		" " " "
48 secs					1.77		" " " "
1 min 3 sec					1.74		" " " "
1 m 33 s					1.67		" " " "
2 m 3 s					1.62		" " " "
2 m 33 s					1.57		" " " "
3 m 8 s					1.52		" " " "
3 m 38 s					1.47		" " " "
4 m 8 s					1.43		" " " "
4 m 38 s					1.38		" " " "
5 m 8 s					1.34		" " " "
5 m 38 s					1.30		" " " "
6 m 8 s					1.27		" " " "
6 m 38 s					1.23		" " " "
7 m 8 s					1.20		" " " "
7 m 38 s					1.16		" " " "
8 m 8 s					1.13		" " " "
8 m 38 s					1.10		" " " "
9 m 8 s					1.07		" " " "

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-11-S PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ____ RADIUS 1"

M.P. FOR WL's T.O.C. EL 222.31

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 11:10

HOW Q MEASURED ____

PUMP OFF: DATE 1/13/87 TIME 11:31

HOW WL's MEASURED Transducer

COMMENTS ____

DISTANCE FROM PUMPED WELL ____

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
9 min 38	sec				1.04		Change in Water Level
10 m 8 s					1.02		" " " "
10 m 38 s					0.99		" " " "
11 m 8 s					0.96		" " " "
11 m 38 s					0.94		" " " "
12 m 8 s					0.92		" " " "
12 m 38 s					0.89		" " " "
13 m 38 s					0.85		" " " "
14 m 38 s					0.82		" " " "
15 m 38 s					0.78		" " " "
16 m 38 s					0.74		" " " "
17 m 38 s					0.71		" " " "
18 m 38 s					0.68		" " " "
19 m 38 s					0.65		" " " "
20 m 38 s					0.63		" " " "
21 m 38 s					0.61		End Slug Test

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-13-D PUMPING/OBSERVATION WELL

TYPE OF DATA ~~DRAWDOWN/RECOVERY~~ Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 223.85

PUMPING RATES Slug In

PUMP ON: DATE 1/13/87 TIME 14:33

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 15:08

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				24.59	0		Static Conditions
0					3.59		Change in Water Level, Slug Installed
2 secs					2.88		" " " "
10 secs					2.16		" " " "
15 secs					1.87		" " " "
30 secs					1.29		" " " "
45 secs					0.86		" " " "
1 min					0.52		" " " "
1 m 20 s					0.26		" " " "
1 m 30 s					0.18		" " " "
1 m 50 s					0.07		" " " "
2 min					0.03		" " " "
3 min					0.09		" " " "
4 min					0.12		" " " "
6 min					0.12		" " " "
8 min					0.13		" " " "
10 min					0.013		End Slug Test

FORM 362

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-13-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 223.85

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 15:20

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 15:49

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES)	t/t'	WATER LEVEL				ADJUSTED DRAW-DOWN (ft)	REMARKS
		READINGS		DEPTH TO WATER (ft)	DRAW-DOWN (ft)		
		REFERENCE	MEASURE				
0				24.70	0		Static Conditions
							Change in Water Level, Slug Removed
10 secs					2.61		" " " "
12 secs					2.50		" " " "
24 secs					1.93		" " " "
36 secs					1.49		" " " "
51 secs					1.10		" " " "
1 min 1 sec					0.90		" " " "
1 m 25 s					0.57		" " " "
1 m 50 s					0.37		" " " "
2 m 15 s					0.25		" " " "
2 m 35 s					0.19		" " " "
3 m 35 s					0.09		" " " "
4 m 35 s					0.05		" " " "
5 m 35 s					0.03		" " " "
6 m 35 s					0.01		" " " "
8 m 35 s					0.01		End Slug Test

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-14-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 222.31

PUMPING RATES Slug In

PUMP ON: DATE 1/13/87 TIME 11:55

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 12:03

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				23.83	0		Static Conditions
0					3.76		Change in Water Level, Slug Installed
12 secs					2.12		" " " "
24 secs					1.59		" " " "
35 secs					1.28		" " " "
46 secs					1.07		" " " "
1 min					0.53		" " " "
2 min					0.36		" " " "
2 m 30 s					0.25		" " " "
3 m 5 s					0.16		" " " "
4 m 5 s					0.07		" " " "
5 m 5 s					0.02		" " " "
6 m 5 s					0.02		" " " "
7 m 5 s					0.01		" " " "
8 m 5 s					0.000		End Slug Test

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL L-14-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 222.31

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 12:48

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 13:00

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				23.82	0		Static Conditions
0					3.98		Change in Water Level, Slug Removed
12 secs					3.17		" " " "
24 secs					2.70		" " " "
36 secs					2.32		" " " "
47 secs					2.03		" " " "
1 min 2 sec					1.69		" " " "
1 m 32 s					1.20		" " " "
2 m 2 s					0.86		" " " "
2 m 32 s					0.63		" " " "
2 m 37 s					0.60		" " " "
3 m 7 s					0.44		" " " "
3 m 37 s					0.33		" " " "
4 m 7 s					0.25		" " " "
4 m 37 s					0.19		" " " "
5 m 7 s					0.15		" " " "
5 m 37 s					0.12		" " " "
6 m 7 s					0.10		" " " "
6 m 37 s					0.08		" " " "
7 m 7 s					0.07		" " " "
7 m 37 s					0.06		" " " "
8 m 7 s					0.05		" " " "
8 m 37 s					0.05		" " " "

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.C0

WELL L-14-D PUMPING/OBSERVATION WELL
TYPE OF DATA DRAWDOWN/RECOVERY Slug Test
PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 222.31
PUMPING RATES Slug Out PUMP ON: DATE 1/13/87 TIME 12:48
HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 13:00
HOW WL's MEASURED Transducer COMMENTS ______
DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
9 min 37	sec				0.04		Change in Water Level
10 m 37 s					0.04		" " " "
11 m 37 s					0.03		End Slug Test

PAGE 1 OF 2

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-15-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 219.14

PUMPING RATES Slug In PUMP ON: DATE 1/13/87 TIME 13:56

HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 14:13

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				21.99	0		Static Conditions
0					4.44		Change in Water Level, Slug Installed
3 secs					4.36		" " " "
6 secs					4.34		" " " "
12 secs					4.02		" " " "
18 secs					3.97		" " " "
24 secs					3.92		" " " "
30 secs					3.87		" " " "
36 secs					3.84		" " " "
46 secs					3.77		" " " "
1 min 1 sec					3.68		" " " "
1 m 31 s					3.51		" " " "
2 m 1 s					3.35		" " " "
2 m 31 s					3.22		" " " "
2 m 36 s					3.19		" " " "
3 m 6 s					3.06		" " " "
3 m 36 s					2.93		" " " "
4 m 6 s					2.81		" " " "
4 m 36 s					2.69		" " " "
5 m 6 s					2.58		" " " "
5 m 36 s					2.47		" " " "
6 m 6 s					2.37		" " " "
6 m 36 s					2.27		" " " "

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-15-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 219.14

PUMPING RATES Slug In

PUMP ON: DATE 1/13/87 TIME 13:56

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 14:13

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
7 min 6 sec					2.17		Change in Water Level
7 m 36 s					2.07		" " " "
8 m 6 s					1.99		" " " "
8 m 36 s					1.90		" " " "
9 m 6 s					1.82		" " " "
9 m 36 s					1.74		" " " "
10 m 6 s					1.66		" " " "
10 m 36 s					1.59		" " " "
11 m 6 s					1.52		" " " "
11 m 36 s					1.45		" " " "
12 m 6 s					1.39		" " " "
12 m 36 s					1.33		" " " "
13 m 6 s					1.20		" " " "
13 m 36 s					1.10		" " " "
14 m 6 s					0.99		" " " "
14 m 36 s					0.90		End Slug Test

CH2M

PUMPING TEST REPORT

PROJECT NO. GN21222.CO

WELL L-15-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1" M.P. FOR WL's T.O.C. EL 219.14

PUMPING RATES Slug Out PUMP ON: DATE 1/13/87 TIME 14:14

HOW Q MEASURED ______ PUMP OFF: DATE 1/13/87 TIME 14:32

HOW WL's MEASURED Transducer COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL READINGS REFERENCE	MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
0				21.09	0		Static Conditions
0					4.51		Change in Water Level, Slug Removed
6 secs					4.41		" " " "
12 secs					4.36		" " " "
24 secs					4.29		" " " "
35 secs					4.25		" " " "
50 secs					4.19		" " " "
1 min					4.16		" " " "
1 m 30 s					4.07		" " " "
2 min.					3.98		" " " "
2 m 30 s					3.90		" " " "
2 m 35 s					3.89		" " " "
3 m 5 s					3.82		" " " "
3 m 35 s					3.74		" " " "
4 m 5 s					3.68		" " " "
4 m 35 s					3.61		" " " "
5 m 5 s					3.55		" " " "
5 m 35 s					3.49		" " " "
6 m 5 s					3.43		" " " "
6 m 35 s					3.37		" " " "
7 m 5 s					3.32		" " " "
7 m 35 s					3.27		" " " "
8 m 5 s					3.22		" " " "

PROJECT NO. GN21222.CO

CH2M

PUMPING TEST REPORT

WELL L-15-D PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY Slug Test

PUMPED WELL NO. ______ RADIUS 1"

M.P. FOR WL's T.O.C. EL 219.14

PUMPING RATES Slug Out

PUMP ON: DATE 1/13/87 TIME 14:14

HOW Q MEASURED ______

PUMP OFF: DATE 1/13/87 TIME 14:32

HOW WL's MEASURED Transducer

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES)	t/t'	WATER LEVEL READINGS REFERENCE	WATER LEVEL READINGS MEASURE	DEPTH TO WATER (ft)	DRAW-DOWN (ft)	ADJUSTED DRAW-DOWN (ft)	REMARKS
8 min 35 sec					3.17		Change in Water Level
9 m 5 s					3.12		" " " "
9 m 35 s					3.07		" " " "
10 m 5 s					3.03		" " " "
10 m 35 s					2.99		" " " "
11 m 5 s					2.95		" " " "
11 m 35 s					2.90		" " " "
12 m 5 s					2.87		" " " "
12 m 35 s					2.83		" " " "
13 m 35 s					2.76		" " " "
14 m 35 s					2.69		" " " "
15 m 35 s					2.62		" " " "
16 m 35 s					2.56		End Slug Test

FORM 362

Appendix E
TECHNICAL OPERATIONS PLAN
(INCLUDING SITE SAFETY PLAN)

INSTALLATION RESTORATION PROGRAM
PHASE II - CONFIRMATION/QUANTIFICATION
STAGE 2

For

MOODY AIR FORCE BASE, GEORGIA

Prepared by

CH2M HILL SOUTHEAST, INC.
7201 N.W. 11th Place
P.O. Box 1647
Gainesville, Florida 32602

10 OCTOBER 1986

TECHNICAL OPERATIONS PLAN

Prepared for

UNITED STATES AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (USAF OEHL)
BROOKS AIR FORCE BASE, TEXAS 78235-5501

347th TACTICAL FIGHTER WING
MOODY AIR FORCE BASE, GEORGIA 31629

TACTICAL AIR COMMAND
COMMAND SURGEON'S OFFICE (HQ/TAC/SGPB)
BIOENVIRONMENTAL ENGINEERING DIVISION
LANGLEY AIR FORCE BASE, VIRGINIA 23665

October 1986
GN21222.C0

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USAF IRP PHASE II - STAGE 2
MOODY AIR FORCE BASE, GEORGIA

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USAF IRP PHASE II - STAGE 2
MOODY AIR FORCE BASE, GEORGIA

gnR301/028

TECHNICAL OPERATIONS PLAN
USAF IRP PHASE II - STAGE 2
MOODY AIR FORCE BASE, GEORGIA

1.0 INTRODUCTION

On 29 May 1986, the USAF Occupational and Environmental Health Laboratory (OEHL) forwarded a draft Statement of Work (SOW) to CH2M HILL. On 12 June 1986, CH2M HILL personnel met with representatives of OEHL and Moody AFB to discuss the SOW and inspect the sites covered by the SOW. Slight modifications were made to the SOW and CH2M HILL prepared and submitted a cost proposal to OEHL on 15 July 1986. The final revision of the cost proposal was made by CH2M HILL on 22 September 1986 at the request of Eric Stark, ASD/PMRSC, Wright-Patterson AFB, Ohio, to incorporate all changes made during negotiations with OEHL personnel. The Task Order was issued with an effective date of 26 September 1986. The applicable contract number is F33615-85-D-4535.

1.1 Purpose and Scope of Study

The intention of this investigation is to undertake a field and laboratory study at Moody AFB, GA to: (1) confirm the presence or absence of contamination within the specified areas of investigation, (2) if possible, determine the extent, degree of contamination, and the potential for migration of those contaminants in the environment, (3) identify public health and environmental hazards of stationary or migrating pollutants based on state or federal standards for those contaminants, and (4) delineate additional investigations required beyond this stage to reach the objectives of Phase II. The specific sites to be investigated during this study are:

Site 1. Southwest Landfill
Site 2. Underground Waste Fuel Storage Area
Site 3. Flightline Storm Drain Outfall
Site 4. Moody AFB Supply Well 10 at Grassy Pond Annex

1.2 Installation Description and History

Moody AFB is located on 5,160 acres of land in Lowndes and Lanier Counties in south-central Georgia. Nearby towns include Valdosta, about 10 miles to the southwest, and Lakeland, about 6 miles to the northeast (Figure 1). The closest large cities include Atlanta, Georgia, 234 miles to the north, and Jacksonville, Florida, about 120 miles to the southeast. Georgia State Highway 124 is the access road to Moody AFB, and U.S. Interstate Highway 75 passes about 10 miles to the west of the base. The current base boundaries are shown on Figure 2.

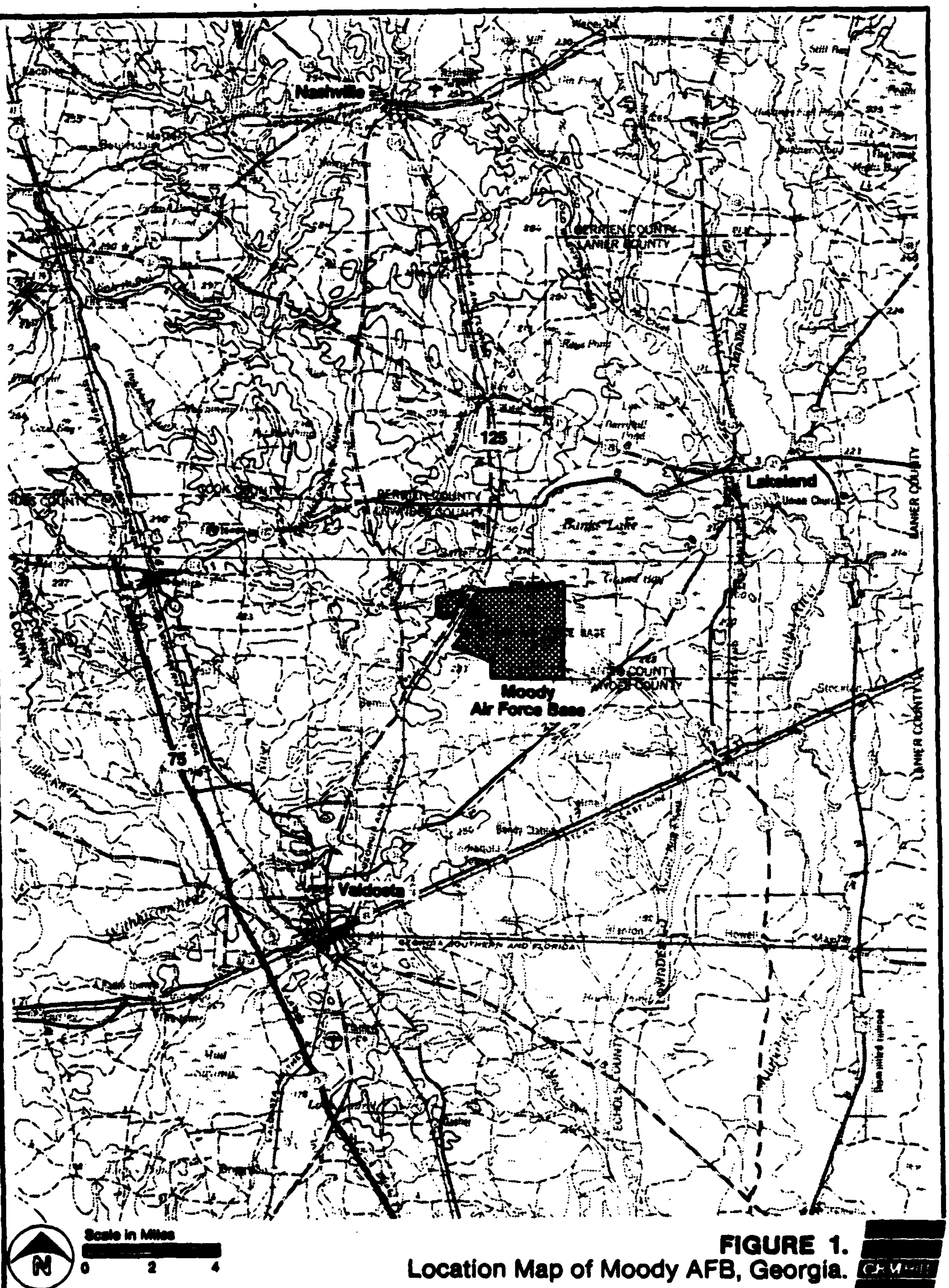

FIGURE 1.
Location Map of Moody AFB, Georgia.

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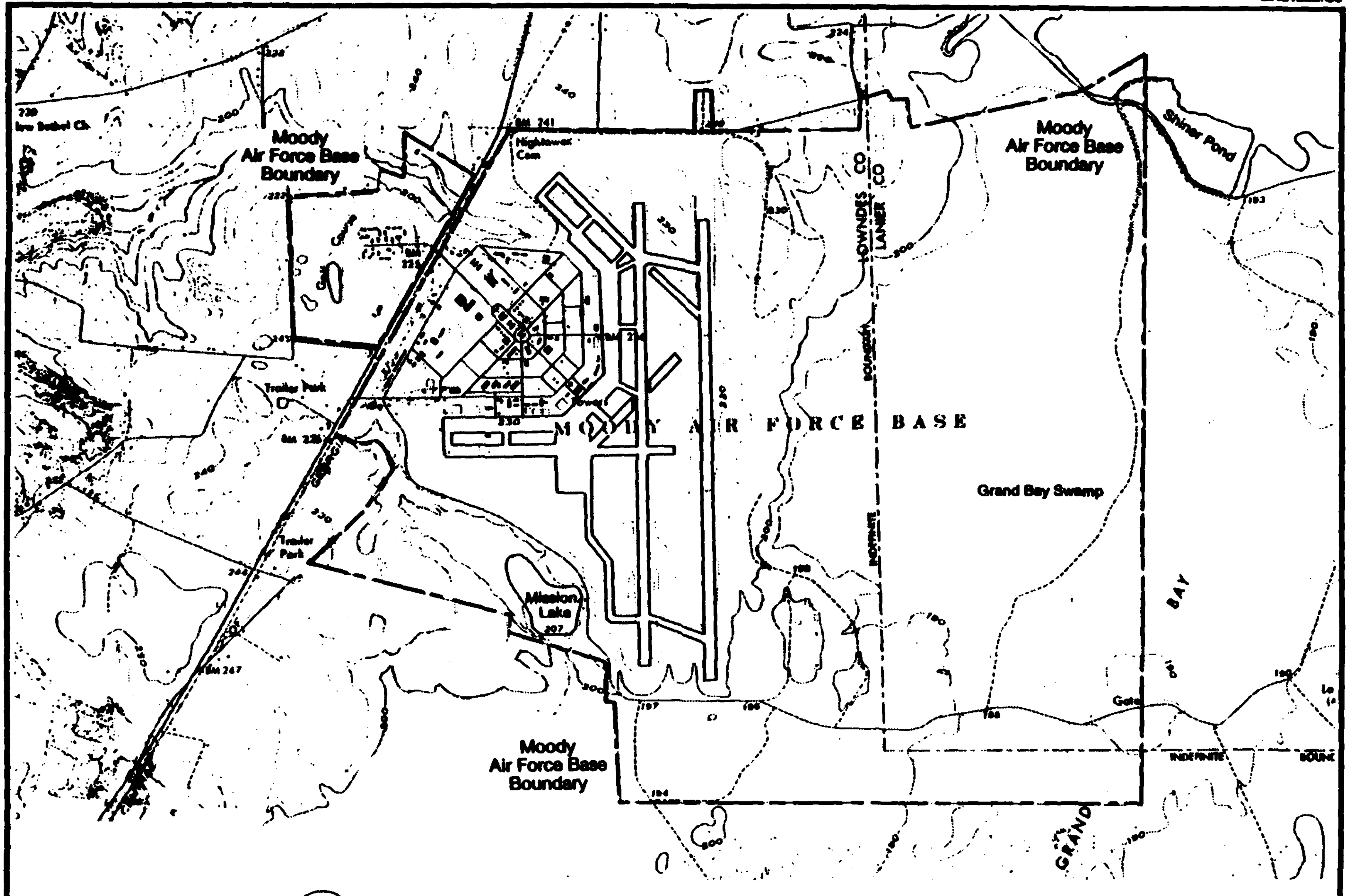

FIGURE 2.
Site Map of Moody AFB, Georgia.

The Grassy Pond Recreational Annex is located 25 miles southwest of Moody AFB, just 3 miles north of the Georgia/Florida state line. This site consists of about 500 acres of land originally sold to the United States Government in 1928 for use as a fish hatchery facility. Major surface features at the site include Grassy Pond (160 acres), Lot Pond (30 acres), and over 300 acres of upland forest and developed areas.

Moody AFB was established in 1941 as an advanced pilot training school for Army Air Corps cadets. The original base boundaries included over 9,000 acres of land acquired by use permit from the United States Department of Agriculture and by lease. In 1946, following the end of World War II, Moody AFB was placed on inactive status until it was reopened in 1951 after the outbreak of the Korean conflict. From that time until 1975, Moody AFB was primarily involved in pilot training under the Air Training Command (ATC), with pre-flight, primary, and basic pilot training programs. In late 1975, ATC deactivated the 38th Flying Training Wing at Moody AFB and the base was reassigned to Tactical Air Command (TAC) and the 347th Tactical Fighter Wing (TFW).

As reported in the CH2M HILL Phase I report, the majority of industrial operations at Moody AFB are associated with maintenance of aircraft engines, aircraft hydraulic systems, wheels and tires, aerospace ground equipment, and corrosion control. These industrial operations have generated among other things, varying quantities of waste oils, fuels, solvents, and cleaners. The total quantity of these wastes ranged from 25,000 to 50,000 gallons per year. The standard procedures for the final disposition of the majority of the waste oils, fuels, and solvents has been (1) fire department training exercises (1941 to 1946), (2) fire department training exercises, contractor collection and removal, and discharge to sanitary sewers and storm drains (1955-1975), and (3) segregation and conveyance to DPDO for off-base disposal (1975-Present).

Interviews with past and present base employees conducted by CH2M HILL during the Installation Restoration Program Phase I Study resulted in the identification of 14 past disposal or spill sites at Moody AFB (Figure 3) and one past landfill site at Grassy Pond Recreational Annex. The Southwest Landfill site is one of the four sites to be investigated by this study. In addition, sampling of Moody AFB Supply Well 10 at the Grassy Pond Annex is required by the SOW. Two new sites, an underground waste fuel storage area and a flightline storm drain outfall, will also be investigated during this study.

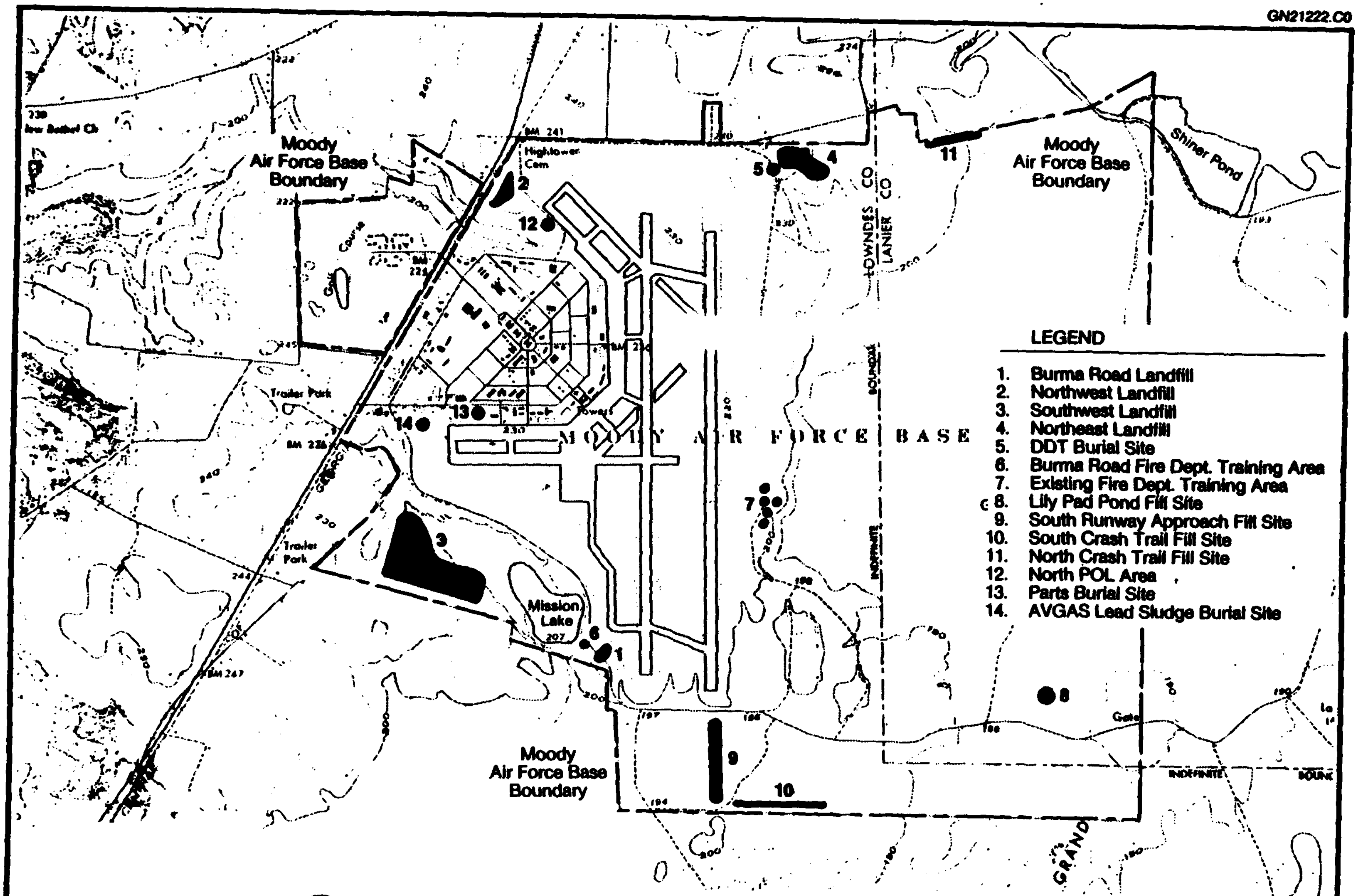

FIGURE 3.
Location Map of Identified Disposal and Spill Sites at Moody AFB, Georgia.

1.3 Description and History of Individual Sites

1.3.1 Site 1 - Southwest Landfill

The Southwest Landfill is located on approximately 30 acres of land along the southwest corner boundary of Moody AFB, west of Mission Lake (Site 1 on Figure 4). From 1955 until 1972, this was the main sanitary landfill for the entire base. Small quantities of hazardous wastes, including waste paints, thinners, and solvents, may have been disposed of at this site during its operation. The operational procedures at the landfill used the trench and fill method. Trenches about 14 feet deep were excavated and backfilled with waste then covered with soil. Tail ditches were dug for collection of surface runoff and are still evident. Loblolly pines have been planted over much of the fill area. Some organic debris (leaves, branches, and grass clippings) are deposited at this site and some composting has been done with sludge from the sewage treatment plant.

Water and Air Research, Inc. (WAR) conducted an IRP Phase II, Stage 1 investigation of this site during the January 1984-December 1985 time period. Six 2-inch monitoring wells were installed at the landfill site to depths below land surface of approximately 25 feet. One of the wells is located upgradient of the landfill and the remaining five are around the downgradient perimeter of the landfill. These wells were sampled and analyzed for groundwater contamination indicators pH, specific conductance, and total organic carbon; metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); chemical oxygen demand (COD); pesticides (DDT, DDT metabolites, heptachlor, heptachlor epoxide, lindane, chlordane, diazinon, malathion, toxaphene, 2,4-D, and 2,4,5-T); and volatile organic compounds as specified in EPA Methods 601 and 602. The analytical results reported by WAR (and provided in tables as part of Appendix A) indicated that the pH was in the mildly acidic range, specific conductance varied from 23 umhos/cm to 728 umhos/cm and DOC and COD results showed little variability among the wells. Metals were generally not detected at significant levels at any well. Very low concentrations well below regulatory maxima of barium and mercury were found, with the levels in the upgradient and downgradient wells being within one order of magnitude. Levels of other metals were below the detection limits for the analytical method used. No detectable levels of pesticides or herbicides were found in any well at the site. Detailed analysis of volatile organic compounds (VOC) indicate detectable amounts of four compounds: chlorobenzene, 1,4-dichlorobenzene, trichloroethene, and benzene. All concentrations were less than 10 ug/l.

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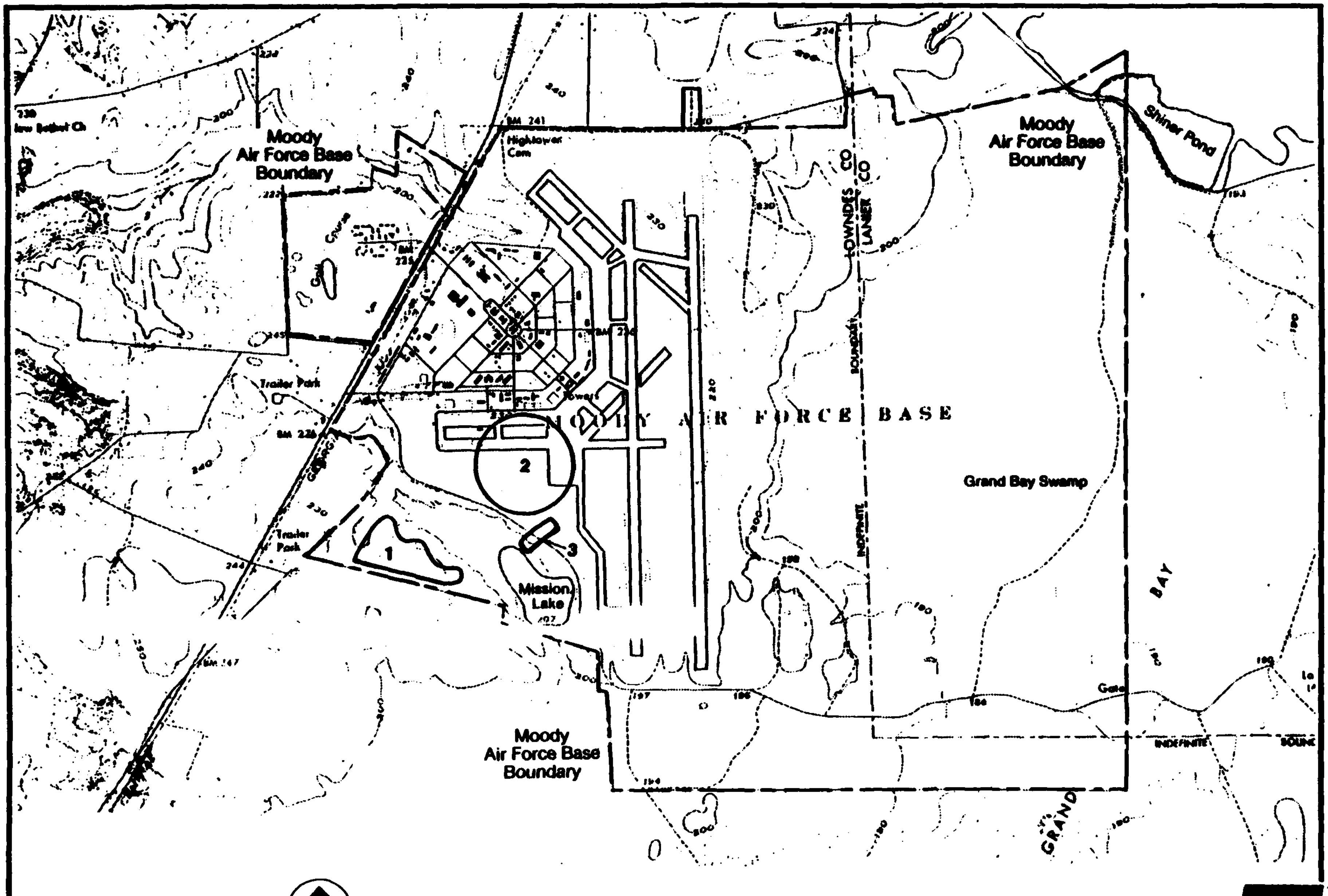

FIGURE 4.
Location Map for Additional Phase II Investigations, Sites 1—3.

1.3.2 Underground Waste Fuel Storage Area

The underground waste fuel storage area is located at the intersection of an access road and taxiway near the aircraft maintenance facilities on the south side of the developed area of the base (Site 2 on Figure 4). TAC reported in a letter dated 20 May 1985 that when the storage tank was removed the surrounding soil was found to be contaminated with JP-4. The extent of saturation is unknown although the tank was emptied periodically. No sampling or analyses have been performed. The former location of the tank is known and accessible.

1.3.3 Flightline Storm Drain Outfall

The primary storm drain pipe providing drainage for the ramp areas of the base near the maintenance areas surfaces and terminates a short distance to the north of the perimeter road between the main ramp and Mission Lake. The drainage ditch continues to the south passing under a bridge on the perimeter road and thence into a small swamp which drains into Mission Lake (Site 3 on Figure 4). Between the perimeter road and Mission Lake, an unimproved road interrupts the flow. The culverts or pipes beneath the unimproved road are at or below surface water levels in the swamp. Consequently, the unimproved road acts as an oil-water separator and oils and greases are clearly visible on the surface of the water. Two other less significant drainage paths are located to the west of the main drainage channel. These drainage paths also drain a portion of the maintenance/ramp area and empty into the swamp to the west-northwest of Mission Lake. No existing sampling or analyses of the waters of the drainage channels, the swamp or the sediments are available.

1.3.4 Moody AFB Supply Well 10

Moody AFB Supply Well 10 is located at the Grassy Pond Recreational Annex, approximately 25 miles southwest of Moody AFB, 3 miles north of the Georgia/Florida state line, and west of Interstate Highway 75 (Figure 5). Moody AFB Supply Well 10 is reported to be 140 feet deep. Sampling and analysis by WAR conducted during their IRP Phase I, Stage 1 study showed TOX levels of 94 ug Cl/l and DOC of 4.9 mg/l.

2.0 SITE INVESTIGATION SUMMARY

In order to carry out the requirements of the SOW covering this investigation, the project has been divided into four phases. The first phase involves the production of the Technical Operations Plan (TOP) and internal project planning. This TOP contains the details governing conduct

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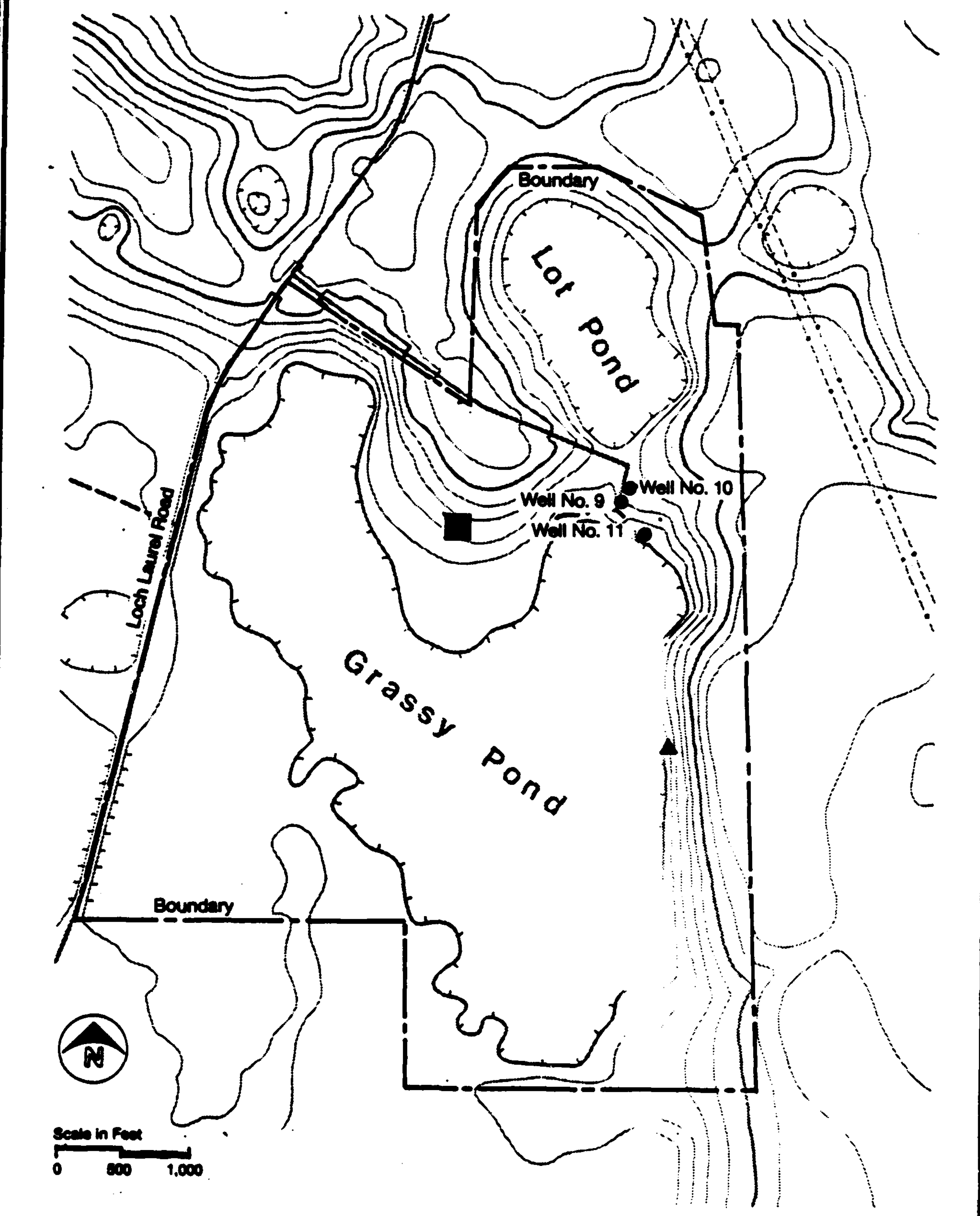

LEGEND
- ● Water Supply Wells
- ▲ Drainage Wells
- ■ Landfill

FIGURE 5.
Site Map of Grassy Pond Recreational Annex, 25 Miles Southwest of Moody AFB, Georgia.

of field data gathering, equipment maintenance and calibration, sampling procedures, sample tracking, quality control, decontamination, and the health and safety plan. Internal planning involves the selection of the team members, obtaining commitments of the departments in which the team members work, detailed scheduling of team members time, detailed scheduling of equipment and supplies, preparation of work assignments, creating the administrative accounts and procedures to track man-hours and funds expended, scheduling of laboratory time, and briefing of the team members prior to deployment to the field.

The second phase involves the field data collection. During this phase, the location of monitoring wells and borings will be marked, the driller deployed, and the monitoring wells constructed in accordance with the requirements of the SOW. All drilling operations will be under the supervision of the lead hydrogeologist. Field data will be collected during the drilling and soil boring operations. Required samples will be collected, labeled, packaged, and shipped to the laboratory for analysis. Headspace, breathing zones, drill cuttings, soil samples, and water will be monitored with field instruments to insure that the proper level of safety precautions will be employed. It is anticipated, based on information available, that most of the field work can be conducted at safety Level D but all field personnel and the driller will be prepared to conduct operations at Level C if it is found to be necessary.

The third phase involves the laboratory analysis of the samples collected in the second phase and preparation of the informal technical report. All analyses will be conducted under strict quality control procedures. Analytical methods have been specified in the SOW and agreed to by CH2M HILL. All samples will be logged into the laboratory upon receipt, notes made regarding the date collected, and the samples will be scheduled for analysis within any maximum holding times applicable. The laboratory results will be checked for acceptable compliance with laboratory quality control criteria for precision, recovery, and completeness. The raw data will be assembled in tabular form to permit comparison with previous results and analysis and incorporated with other field data into the informal technical report.

The fourth phase includes evaluation of the data to estimate the magnitude, extent, direction, and velocity in which detected contaminates are moving. The potential environmental and health consequences of the discovered contaminants will be estimated based on Georgia and/or EPA standards. Recommendations will be formulated for each site investigated regarding what future action should be taken. Finally, the draft report will be produced for USAF review

incorporating all of the above data as well as pertinent information produced in previous studies. The second draft will incorporate USAF comments and the revised draft forwarded to the USAF for coordination with the regulatory agencies. Any modifications in the report required by the regulatory review comments will be made and the final report submitted to OEHL.

2.2 Investigation of Individual Sites

2.2.1 Southwest Landfill: The Phase II work for this site consists of installing six shallow and three deep monitoring wells around the landfill periphery. The wells will be measured and sampled (with some existing wells) to further assess groundwater conditions in the general vicinity. During drilling, subsurface samples will be obtained for classification and organic vapor monitoring. Details regarding the well locations, drilling, sampling, monitoring procedures, sample analyses, etc. are addressed in Sections 8.0 and 10.0 of the TOP.

2.2.2 Underground Waste Fuel Storage Area: The Phase II work for this site consists of installing ten temporary wellpoints in the vicinity and measuring the wellpoints for water level and floating hydrocarbon product. Based on the results obtained, four shallow monitoring wells will be installed, and a Standard Penetration Test (SPT) boring conducted in the area of highest contamination. During drilling of the wellpoints, and monitoring well boreholes, subsurface samples will be obtained for classification and organic vapor monitoring. Some soil samples from the SPT boring will be obtained for laboratory chemical analyses. Monitoring wells will be measured and sampled to assess groundwater conditions in the general area. Temporary wellpoints will be abandoned. Details regarding boring, wellpoint and monitor well locations, drilling, boring, sampling, monitoring procedures, sampling analyses, abandonment procedures, etc., are addressed in Sections 8.0 and 10.0 of the TOP.

2.2.3 Flightline Storm Drain Outfall: The Phase II work for this site consists of obtaining five water and five sediment samples from the storm drainage system. Details regarding sampling locations, sampling procedures, sample analyses, etc., are addressed in Section 10.0.

2.2.4 Moody Supply Well 10 - Grassy Pond Annex: The Phase II work for this site consists of collecting a sample from Moody Supply Well No. 10 and analyzing the sample. Details regarding sampling procedures, sample analyses, etc., are addressed in Section 10.0.

3.0 FIELD SET-UP

This section outlines and discusses procedures to be followed in executing the field operation activities of the Phase II work. CH2M HILL will lead all field operations and data collection efforts, with subcontractors involved only with drilling and monitor well installations.

3.1 Detailed Work Plan

This subsection describes the activities and procedures associated with the actual planning, execution and control of the field work activities. This task is the ultimate responsibility of the CH2M HILL Project Manager (PM), supported by the Project Hydrogeologist (PH), Site Safety Coordinator (SSC), and Laboratory Manager (LM). Additional details relative to the execution of individual field work tasks are contained in other appropriate sections of the TOP.

One the week prior to the startup of the field operations (currently scheduled for Monday, 10 November 1986), the PH will arrive on-site. The primary purpose of the trip, in addition to attending a project meeting with OEHL and the PM, will be to coordinate activities with the Base Civil Engineer (BCE) and Base Point of Contact (POC), and make all necessary preparations for the start-up of the drilling and monitoring well installation work. The specific items requiring attention to detail will be as follows:

- Staking the locations of all boring and monitoring well installations. This will require the BCE to locate all underground utilities and issue digging or other appropriate permits;
- Identifying the location and datum of the most convenient point of known NGVD elevation;
- Identifying the past location of underground storage tank(s) at the Underground Waste Field Storage Area (Site 2);
- Arranging with base personnel to have the base water supply wells that are to be sampled pumped prior to obtaining water quality samples (if wells have been inactive);
- Identifying the base locations of the potable water/electrical source that will be available to the drilling subcontractor, and the adjacent paved area to be used for decontamination of the drilling equipment;

- Identifying the base location of the accumulation point for the transport of drums containing contaminated well cuttings, etc.;

- Identifying the base location of a secured storage area for equipment and supplies, including drilling rigs and associated equipment;

- Obtaining vehicle passes, entry permits, personnel identification badges or other requirements necessary for all field activity personnel (including subcontractor) to gain access to the base and site areas;

- Identifying the location for the delivery/storage of all soil or water samples to the BCE, and the nearest location of a Federal Express overnight mail service center for sample shipment;

- Providing orientation of the above to all field activity personnel. This will include the drilling subcontractor, who will mobilize equipment to the site on the Friday before the Monday morning of work start-up.

3.2 Health and Safety Plan

A Health and Safety Plan for the Phase II work has been developed by the SSC and is provided as Appendix A. It will be bound separately and issued for use by field personnel. CH2M HILL will provide a copy of the plan to the subcontractor for their information and use, but does not accept responsibility for the health and safety of subcontractor personnel.

Based on existing information from Phase I activities at the landfill site and CH2M HILL experience with JP-4 product in unconfined groundwater table aquifers, it is likely that the drilling, boring and well installation work will be performed with Level D protective procedures. However, field instrumentation (described in more detail later) will be utilized to monitor conditions and assess the need to upgrade the level of protection. Should a higher level of protection become necessary, a change in project scope will be required.

3.3 Subcontractor Information

The area of effort requiring subcontracting will involve the drilling, boring, and monitoring well installation work. Bids, in response to specifications to be developed for the scope of work, will be solicited from at least four qualified drilling and testing companies with

whom CH2M HILL has had past experience or knowledge. At present, these companies include Liberty Drilling, Testing and Boring, Inc. (Ocala, Florida); Drilling Services Incorporated (Ft. Pierce, Florida); Pittsburgh Testing Laboratory (Atlanta, Georgia); and Blackhawk Drilling and Boring, Inc. (Melbourne, Florida).

Bids will be evaluated and ranked by CH2M HILL on the basis of bid estimates, knowledge and experience of the individual drilling personnel within the company to be assigned to the project, and the availability and type of drilling equipment for the project. The selected company will be subcontracted under a standard CH2M HILL services/ subconsultant purchase order form, and will be required to meet the CH2M HILL insurance requirements specified on the reverse side of the order. A copy of the standard purchase order form is provided as Figure 6.

4.0 CALIBRATION OF FIELD EQUIPMENT

This section outlines the major pieces of CH2M HILL field equipment to be utilized during the project. It also discusses the purpose of the instruments and the calibration procedures involved.

CH2M HILL maintains an equipment rental program in each of its regional offices. Each office has an Equipment Coordinator who inspects, maintains, and calibrates field equipment as it goes out or comes into the office. Additionally, personnel assigned to the field data collection program have received EPA-approved health and safety training, including the use and calibration of field equipment to be utilized on the project.

4.1 Conductivity and pH Meters

The Model 33 SCT Conductivity Meter measures specific conductance in mhos and temperature in degrees Centigrade. It is manufactures by YSI, Inc. The pH meter measures hydrogen ion activity in standard units and is manufactured by Orion, Inc. Both meters are used to initially characterize surface and groundwater samples. In the case of groundwater sampling, the instruments are also utilized in gauging well evacuation for the purpose of obtaining as representative a sample as possible.

The meters are calibrated at least twice a day with known standards. The standards are obtained from the equipment manufacturer or from a scientific supply company. The Equipment Coordinator will be responsible for providing calibration standards along with the equipment.

PURCHASE ORDER NO. ____________

PROJECT NO. ____________

CH2M **SERVICES (OR SUBCONSULTANT) PURCHASE ORDER**

BILL AND DELIVER TO:

VENDOR ____________

CH2M HILL ____________ , INC.
CORPORATION

DATE SERVICES: TO BEGIN ____________ TO BE COMPLETED ____________

NOTES:

1. IF THE DOLLAR VALUE OF THIS PURCHASE ORDER EXCEEDS $10,000, ISSUER MUST ATTACH CH2M HILL E.E.O.C. FORM NO. 119A TO THIS PURCHASE ORDER, PURSUANT TO INSTRUCTIONS APPEARING ON THE REVERSE SIDE HEREOF.
2. PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES.

SCOPE OF WORK ____________

COMPENSATION: ____________

THE GENERAL CONDITIONS APPEARING ON THE REVERSE SIDE HEREOF ARE A PART OF THIS PURCHASE ORDER, AS WELL AS ANY DRAWINGS, SPECIFICATIONS, OR OTHER PAPERS ATTACHED.

TERMS AND CONDITIONS ACCEPTED BY VENDOR.

____________ VENDOR

____________ BY

____________ TITLE ____________ DATE

____________ AUTHORIZED SIGNATURE

____________ EMPLOYEE NO.

____________ DATE

COPY TO: VENDOR

FIGURE 6.

SERVICES PURCHASE ORDER
GENERAL CONDITIONS

1. The work included in this purchase order shall be performed by vendor at its (his) own expense, including the furnishing of all labor, materials, and equipment required, and shall be performed strictly in accordance with the terms and conditions of CH2M HILL'S general contract with the owner (if applicable). The work shall be subject to the inspection and approval of CH2M HILL.

2. As required by CH2M HILL, vendor shall, during performance of services covered by this purchase order, maintain worker's compensation coverage in accordance with the laws of the state where the work is performed, and shall furnish certificates of insurance showing that he has auto and general liability coverage of $500,000/$1,000,000 for death and injury, and $500,000 property damage, and professional liability coverage as deemed necessary by the project manager for CH2M HILL. The liability insurance coverage must be with a company or companies satisfactory to CH2M HILL. Certificates of such insurance shall be furnished to CH2M HILL by vendor prior to commencement of the work.

3. Vendor shall comply with all federal, state, and local laws, regulations, and ordinances applicable to the work to be done under this purchase order.

4. Vendor shall protect, defend, and indemnify CH2M HILL, its officers, employees, and agents of and from any and all claims, damages, compensation, suits, actions and expenses, including reasonable attorneys' fees, relating to any and all losses or damages sustained by, or alleged to have been sustained by any person, including employees of the parties hereto, and occasioned or allegedly occasioned in whole or in part by the negligent acts or omissions of the vendor, or anyone directly or indirectly employed by the vendor, while in any way engaged in the performance of this purchase order.

5. Vendor shall not sublet or assign any of the work covered by this purchase order except with prior written approval of CH2M HILL.

6. Vendor may submit claims to CH2M HILL for progress payments not more than once each month by the 25th of each month; such payments will be made within ten (10) days of receipt by CH2M HILL of reimbursement by the owner for each claim, except that claims for progress payments in amounts less than $500.00 will be paid when normally due without regard to CH2M HILL'S reimbursement by the owner.

7. If it becomes necessary for CH2M HILL to take legal action to enforce any term of this purchase order, vendor shall be liable to CH2M HILL for all costs incurred in such legal action, including reasonable attorneys' fees.

INSTRUCTION TO ISSUER:

CH2M HILL is required by federal law (Executive Order 11246) to pass equal employment opportunity provisions along to its subconsultants and vendors; therefore, if the dollar value of this purchase order exceeds $10,000, issuer must attach CH2M HILL E.E.O.C. Form No. 119A to this purchase order. Vendor's signature of acceptance on the reverse side of this form will include acceptance of the E.E.O.C. Form No. 119A and its provisions, when attached to this purchase order.

4.2 HNU® Photoionization Detector

The HNU® monitors and scans the presence of organic (and some inorganic) vapors in air, and in soil and water samples. (Soil and water samples are checked in the headspace of the sample container, not in the sample medium itself.) The HNU® is used to initially and qualitatively characterize the presence of organic contaminants in samples. It is also used to monitor the breathing zone during drilling and sampling efforts in order to assess the level of protection required for the health and safety of the field personnel. Several probes are available, each containing a different UV light source, ranging in detection of compound ionization potentials from 9.5 to 11.7 eV. A standard probe with detections up to 10.2 eV is generally considered to be the most useful for environmental response work, as it is more durable than an 11.7 eV probe and detects more compounds than a 9.5 eV probe.

The HNU® is calibrated daily before work begins with a manufacturer or scientific company supplied canistor of span or calibration gas containing isobutylene. The unit is first placed in the stand-by mode, allowed to warm up, and the response indicator adjusted to zero. Following connection to the span gas, the potentiometer knob on the unit is turned to 9.8 eV and the response indicator adjusted to measure the recommended concentration reading for the calibration gas.

4.3 MSA 261 Explosimeter

This instrument monitors combustible gases and oxygen levels in the atmosphere during drilling, site exploration or other activities. It is used primarily to assess explosion hazards. This unit is calibrated daily before work begins with a span gas supplied by the manufacturer or scientific company. Prior to span gas connections, the LEL response is set to zero, and the oxygen level set to 21.5 percent. The span gas will cause the alarm to sound once explosion potential (20 percent LEL) is reached. Placing a finger over the air intake will cause the oxygen level to decline, triggering an alarm at the 19.5 percent level.

4.4 Water Level Data Recording Systems

CH2M HILL rents an In-Situ® SE 1000A and/or an Envirolabs® EL 200 pressure transducer data recording system. Each system allows for recording 0.01 foot changes in water levels over periods as short as 1 second. The In-Situ® is a single channel recorder whereas the Envirolabs® has 4-8 separate channels. Each uses a transducer rated at an appropriate PSI for the water depth

conditions to be encountered in monitoring wells. Waterproof cables and connections are run from the transducer up the well to the recorder which is battery powered. Both the In-Situ® and Envirolabs® instruments have on-site printout capabilities to allow data screening. The units are calibrated by the owner prior to deliver to the project team and only the electronic displays need to be checked during set-up.

5.0 PREVENTIVE MAINTENANCE OF FIELD EQUIPMENT

The CH2M HILL Equipment Coordinator is responsible for overall maintenance of equipment and obtaining manufacturer calibrations or repairs periodically required. However, there are some procedures used by field personnel to promote equipment operation on a day to day basis. The following procedures are involved:

- Conductivity and pH meters: Both units are battery powered which require checks daily, and replacement as necessary. Both probes should be rinsed with deionized water following sample checks. Both probes should also be cleaned following the day's use with solutions prepared by the Equipment Coordinator. The conductivity probe must be kept moist overnight by wrapping in a wet towel.

- HNU® P.I.D.: The system is battery powered and has an AC adaptable recharger. The system should be recharged nightly. Also the UV lamp requires removal and cleaning, as frequently as required to maintain a positive indicator response.

- Explosimeter: The system is battery powered and has an AC adaptable recharger. The system should be recharged nightly.

- Water level recorders: The units are battery powered and have AC adaptable rechargers. The systems must be recharged in accordance with manufacturer recommendations. Also, care needs to be taken to ensure sufficient data memory available for the next sets of recordings.

6.0 FIELD ANALYTICAL PROCEDURES AND DATA REPORTING

This section outlines and discusses how the field and analytical data for Phase II activities will be obtained and reported. Detailed procedures as to specific laboratory analytical procedures, water quality sampling techniques,

use of field instruments during drilling work, and actual drilling/boring/well installation methods are addressed in other appropriate sections of the TOP.

6.1 Chemical Data

Following completion of Phase II work, laboratory analytical data will be available from the various base areas of investigation involving groundwater, surface water, and soil and sediment quality information. The analyses for individual sample numbers (associated with a specific sample site) will be provided on a standard CH2M HILL Gainesville Laboratory Report of Analysis form. An example of a typical laboratory report is shown on Figure 7.

Upon receipt of the laboratory reports, the project hydrogeologist will summarize the results into tables for comparative purposes and quick reference. The summary tables will identify the sample date, location, designation, and analytical results for individual parameters or groups of parameters (e.g. the summation of those parameters measured by EPA Method 602), and contain clarifying footnotes as necessary. A preliminary listing of summary tables to be developed are as follows:

- Summary of Groundwater Sampling--New and Existing Monitoring Wells--Southwest Landfill (Site 1)
- Summary of Soil Cutting Composite Samples--Southwest Landfill (Site 1)
- Summary of Groundwater Sampling--New Monitoring Wells--Underground Waste Fuel Storage Area (Site 2)
- Summary of Soil Boring Analyses--Underground Waste Fuel Storage Area (Site 2)
- Summary of Soil Cutting Composite Samples -- Underground Waste Fuel Storage Area (Site 2)
- Summary of Surface Water Sampling --Flightline Storm Drain Outfall (Site 3)
- Summary of Sediment Sampling--Flightline Storm Drain Outfall (Site 3)
- Summary of Groundwater Sampling--Moody AFB Supply Well No. 10 (Site 4)

All summary tables and standard laboratory analysis report forms will be included in the informal technical report and the Phase II report.

CH2M HILL
ENVIRONMENTAL LABORATORIES
7201 N. W. 11th Place - P. O. Box 1647
Gainesville, Florida 32602
904/377-2442

Sample No.
Number of Samples:
Date Reported:

REPORT OF ANALYSIS

Page 1 of

Client:
Attention:
Address:

Project No.
Received:

Description of Sample:

EPA Method 601

Chloromethane
Bromomethane
Vinyl Chloride
Chloroethane
Dichloromethane
1,1-Dichloroethene
1,1-Dichloroethane
Trans-1,2-Dichloroethene
Chloroform
1,2-Dichloroethane
1,1,1-Trichloroethane
Carbon Tetrachloride
Dichlorobromomethane
Cis-1,3-Dichloropropene
1,2-Dichloropropane
Trichloroethene
Dibromochloromethane
Trans-1,3-Dichloropropene
1,1,2-Trichloroethane
2-Chloroethylvinyl Ether
Bromoform
1,1,2,2-Tetrachloroethane and
1,1,2,2-Tetrachloroethene

NOTE: Method Detection Limit=1 ppb
unless specified otherwise
BMDL=Below Method Detection Limit

EPA Method 602

Tert-Butyl Methyl Ether
Benzene
Toluene
Chlorobenzene
Ethyl Benzene
O-,M- and P-Xylene
P-Dichlorobenzene
M/O-Dichlorobenzene

NOTE: Method Detection Limit=1 ppb
unless specified otherwise
BMDL=Below Method Detection Limit

Respectfully submitted,

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

FIGURE 7.

6.2 Hydraulic Data

This type of information will result from development, recovery testing, and slug testing of the new monitoring wells, and water level measurements on all monitoring wells.

6.2.1 Development Activities

Following the installation of new monitoring wells, they will be developed. This involves procedures (see Section 8.3) to surge water back and forth through the well screen and gravel packing surrounding the screen to remove fine particles, stabilize conditions, and improve well efficiency. It also typically involves pumping the wells until the water yielded is clear. Although a function of the initial depth to water, subsurface permeability, well construction, and the degree of development achieved, pumping typically occurs on the order of 30 minutes to an hour at flow rates relatively proportional to the hydraulic conductivity of the subsurface materials in contact with the screened interval of the well.

During well development (assuming wells can be pumped), records of flow rate, pH, specific conductance and temperature will be kept on the well discharge water. Data will be obtained at the start of pumping, at approximate 10-15 minute intervals during pumping, and at the end of pumping. Flow rate will be measured with a stop watch and a container of known volume. pH will be measured with an Orion pH probe. Specific conductance and temperature will be measured with a SCT conductivity meter (YSI, Inc.)

The data obtained from each well will be reported on a standard CH2M HILL Form 362 pumping test report, shown on Figure 8, and will be included in the Phase II report.

6.2.2 Well Recovery and Slug Tests

These tests involve procedures used on individual monitoring wells (following well development) to obtain indicator estimates of the hydraulic conductivity in the immediate vicinity of the aquifer penetrated by the wells. They are generally used where well locations, economic considerations, or background water quality are not conducive to running a full scale pumping test. In the proposed testing, CH2M HILL typically uses an In-Situ® and/ or Envirolabs® pressure transducer data recording system to record well water level responses induced by the field procedures.

Well recovery tests are conducted where pumping is possible. The pressure transducer is lowered into the well to a convenient depth, usually the bottom of the well, and

PAGE ___ OF ___

PUMPING TEST REPORT

PROJECT NO. ______

WELL ______ PUMPING/OBSERVATION WELL

TYPE OF DATA DRAWDOWN/RECOVERY

PUMPED WELL NO. ______ RADIUS ______

M.P. FOR WL's ______ EL ______

PUMPING RATES ______

PUMP ON: DATE ______ TIME ______

HOW Q MEASURED ______

PUMP OFF: DATE ______ TIME ______

HOW WL's MEASURED ______

COMMENTS ______

DISTANCE FROM PUMPED WELL ______

TIME SINCE PUMPING START/ STOPPED (MINUTES	t/t'	WATER LEVEL				ADJUSTED DRAW-DOWN (ft)	WELL DEVELOPMENT DATA				
		READINGS		DEPTH TO WATER (ft)	DRAW-DOWN (ft)		T (min)	Q (gpm)	pH (SU)	S.C. (µhos)	TEMP. (°c)
		REFERENCE	MEASURE								

FORM 382

FIGURE 8.

the initial head noted. The pump is then started and run until a constant flow and measurable drawdown is achieved. Upon stopping the pump, the data recording system is started to record the rise in water level as it approaches the original level. Water level response data, specific capacity data, and other appropriate information obtained for each well will be entered on the standard pumping test report form previously referenced as Figure 8. A standard form will be completed for each well, and will be included in the Phase II report.

Slug tests are conducted by inducing an instantaneous change in water level in the well and measuring the associated water level response. Following placement of the transducer and measurements of the initial water level, a PVC cylinder containing sand or concrete of known volume (commonly called a "slug") is typically inserted into the well to induce an essentially instantaneous rise in the well water level. The recording equipment records the rate at which the water levels falls to its static level. The slug is then quickly removed, inducing a corresponding instantaneous drop in water level. The data recorder records the rise in water level as it again approaches the original level. These water level response data and other appropriate information obtained from each each test will be entered on the standard pumping test report form (Figure 8). A standard form will be completed for each well test and will be included in the Phase II report.

Numerous methods of analyzing data obtained from these in-situ well tests exist. They involve relationships between the time required for a particular change in head to occur and the geometry of the monitoring well construction, and are analyzed to obtain an average estimate of the hydraulic conductivity value. The particular methods to be utilized in evaluating the data involve the following sources:

- Bouwer, H. and R. C. Rice, 1976. A Slug Test for Determing Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells. Water Resources Research Vol. 12, No. 3.

- Hvorslev, M. J., 1951. Tim Lag and Soil Permeability in Groundwater Observations. U.S.C.O.E. Waterways Experimental Station Bulletin No. 36.

- U.S. Navy, 19__. Computation of Hydraulic Conductivity from Variable Head Tests. U. S. Navy Bureau of Yards and Docks.

- Cooper, H. H., Bredehoeft, J. D. and I. S. Papadopulos, 1967. Response of a Finite-Diameter Well to an Instantaneous Charge of Water. Water Resources Research, Vol. 3, No. 1.

- Nguyen, V. and G. F. Pinder, 1984. Direct Calculation of Aquifer Parameters in Slug Test Analysis. Water Resources Monograph Series No. 9: Groundwater Hydraulics. American Geophysical Union.

Slug test analyses are subject to a wide variety of influences and interpretations. As a result, the following procedure will be utilized to evaluate the test data:

- Two of the new shallow monitoring wells to be installed at both the Southwest Landfill and the Underground Waste Fuel Storage Area sites will be used for methodology screening purposes. The two wells selected from each site will reflect the same general hydrogeologic setting at that particular site. The five analytical procedures (referenced above) will be run on the data obtained from those wells and compared. Based on the results obtained and hydrogeologic considerations involved, the most appropriate technique(s) will be selected for use in analyzing the test data from the remaining shallow monitoring wells.

- All five analytical procedures will be run on the data obtained from the two deep monitoring wells to be located at the Southwest Landfill site. The results will be compared and the most appropriate technique(s) selected, based on hydrogeologic considerations involved.

- Hydraulic conductivity will be estimated in a range of most probable values for each site.

The Phase II report will contain a discussion of the selected analytical method(s) and tables summarizing the results of the analyses for the two sites.

6.2.3 Water Level Maps

Another requirement for use in studying the groundwater hydraulics of a site is a map showing contours of groundwater elevations. This provides information regarding hydraulic gradients and lateral directions of groundwater flows. Details as to how groundwater elevations are established and measured are discussed in Section 10 of the TOP.

Two such maps are available for the shallow aquifer in the Southwest Landfill vicinity, prepared by WAR, Inc. and presented in a December 1985 Phase II Stage I report. The maps are for the months of April and September 1984. Another map will be prepared for this site using both the existing and new monitoring wells to be installed, and based on water levels measured at the time of water quality sampling. The current project schedule indicates that the levels will reflect November 1986 conditions.

Two shallow groundwater table maps will be prepared for the Underground Waste Fuel Storage Area site. One map will reflect preliminary water levels, based on temporary wellpoint installations and an arbitrary benchmark elevation. The other map will reflect groundwater elevations based on installation of four new monitoring wells, a known NGVD benchmark, and water levels measured at the time of water quality sampling. The current project schedule indicates that the levels will reflect November 1986 conditions.

A preliminary listing of associated figures and tables to be provided in the Phase II report are as follows:

- o Groundwater Elevations in the Shallow Aquifer--April 1984--Southwest Landfill (figure)
- o Groundwater Elevations in the Shallow Aquifer--September 1984--Southwest Landfill (figure)
- o Groundwater Elevations in the Shallow Aquifer--November 1986--Southwest Landfill (figure)
- o Summary of Water Level and Groundwater Elevation Data, 1984-1986--Southwest Landfill (table)
- o Water Levels from Temporary Wellpoint Installations--Underground Waste Fuel Storage Area (figure)
- o Groundwater Elevations in the Shallow Aquifer--November 1986--Underground Waste Fuel Storage Area (figure)
- o Summary of Water Level and Groundwater Elevation Data, November 1986--Underground Waste Fuel Storage Area (table)

6.3 Soil Boring Data

Generally, subsurface samples will be obtained at five-foot intervals at every location for permanent monitoring well installations. The samples will be classified in the

field to prepare a lithologic log for the borehole, and scanned for organic vapors using an HNU®. At the Underground Waste Fuel Storage Area Site, an additional eleven borings will be conducted, one of which involves a standard penetration test pursuant to ASTM D-1586. Details on obtaining samples and boring procedures are addressed in Section 8.2.1.

Sample classifications, depths, and organic vapor readings will be reported on a standard CH2M HILL Form 361 Well Drilling Report, shown in Figure 9. A form will be completed for every borehole and provided in the Phase II report. Data from the standard penetration test boring will be reported on a standard CH2M HILL Soil Boring Log, shown in Figure 10, and provided in the Phase II report.

At least two hydrogeologic cross-sections will be prepared for each site using the new boring logs and information from logs of existing monitoring wells, where available. These cross-sections will be provided in the Phase II report.

6.4 Monitoring Well Construction Data

The standard Well Drilling Report Form referenced in Section 6.3, above, and shown in Figure 9, will be completed for every new monitoring well installation. Also, a figure will be prepared showing typical well construction and completion details. Additionally, a table summarizing all new well construction details will be prepared. All information will be included in the Phase II report.

6.5 Surveying Data

The SOW requires permanent markers and horizontal location of all new monitoring wells, boreholes, and sampling points. It also requires establishing the elevation of all wells. The procedures involved in meeting the surveying requirements are addressed in Section 10.2

Information obtained from the survey will be utilized to generate a 22" x 34" plot (at an appropriate scale) for each site showing the established baseline coordinates and the respective horizontal location of surveyed points. It will also provide the elevation of the monitoring wells. From these, separate 8½" x 11" site maps will be prepared for the Phase II report showing the relative location of surveyed points. Vertical elevations for the wells will be included in the monitoring well construction summary table, referenced in Section 6.4.

DEPTH	CLASSIFICATION	Vapor Log	WELL CONSTRUCTION DATA	

CH2M HILL

WELL DRILLING REPORT

PROJECT NO. ______________

WELL: ______________

LOCATION: ______________

____

____

COUNTY: ______________ STATE: ______

GROUND ELEVATION: ______________

DIAMETER: ______________

DEPTH: ______________

STATIC WATER LEVEL: ______________

DATE: ______________

CASING: ______________

SCREEN: ______________

____

CONSTRUCTION: ______________

DRILLER: ______________

____

DATE FINISHED: ______________

PUMPING TEST

SPECIFIC YIELD ______ gpm/ft @ ______ gpm

WATER ANALYSIS (ppm)

TDS ______________

TOTAL HARDNESS[1] ______________

M.O. ALKALINITY[1] ______________

CHLORIDE Cl ______________

IRON Fe ______________

SULFATE SO_4 ______________

COLOR (APHA) ______________

CALCIUM[1] ______________

COMMENTS ______________

____

____

____

COMPILED BY ______________

DATE ______________

[1] AS $CaCO_3$

FIGURE 9.

FORM 361

CH2M HILL

PROJECT NUMBER	BORING NUMBER
	SHEET OF

SOIL BORING LOG

PROJECT ______________________ LOCATION ______________________

ELEVATION ______________________ DRILLING CONTRACTOR ______________________

DRILLING METHOD AND EQUIPMENT ______________________

WATER LEVEL AND DATE ____________ START ____________ FINISH ____________ LOGGER ____________

ELEVATION	DEPTH BELOW SURFACE	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
		INTERVAL	TYPE AND NUMBER	RECOVERY	6"-6"-6" (N)	NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

REV 11/82 FORM D1586

FIGURE 10.

7.0 SAMPLE NUMBER SYSTEM

7.1 Project Identification

The first letter in all samples will be an M which will identify that the samples were collected from the Moody AFB.

7.2 Site Identification

Individual samples from each site will be differentiated by the second letter in the sample identification as, shown below

L = Landfill (Site 1)
U = Underground Waste Storage Area (Site 2)
F = Flight Line Storm Drain Outfall (Site 3)
G = Grassy Pond Annex (Site 4)

7.3 Sequence Number

For each site, similar sample types (e.g. wells, sediment samples, etc.) will be assigned sequential numbers starting with the number one.

7.4 Sample Depths

Deep well identifications (100 feet) will include a "D" for Deep in the sample prefix. Shallow well identifications (30 feet) will include an "S" for Shallow in the sample prefix.

7.5 Split Samples

The last letter assigned to a given sample identification will include the letter "X" for those samples that will be split for analysis by the OEHL laboratory.

7.6 Examples of Sample Numbering

All samples, including the temporary borehole samples, will be assigned unique alpha-numeric identifications. These sample identifications for all samples to be collected are provided below.

Site 1-- Southwest Landfill

Sample Location	Description
ML-1	Existing Shallow Monitoring Well
ML-2	Existing Shallow Monitoring Well
ML-3	Existing Shallow Monitoring Well
ML-7S	New Shallow Monitoring Well
ML-8S	New Shallow Monitoring Well
ML-9S	New Shallow Monitoring Well
ML-10S	New Shallow Monitoring Well
ML-11S	New Shallow Monitoring Well
ML-12S	New Shallow Monitoring Well
ML-13D	New Deep Monitoring Well
ML-14D	New Deep Monitoring Well
ML-15D	New Deep Monitoring Well
MLDC-1	Drum Cuttings For EP Toxicity
MLDC-2	Drum Cuttings For EP Toxicity
MLDC-3	Drum Cuttings For EP Toxicity
MLDC-4	Drum Cuttings For EP Toxicity
MLDC-5	Drum Cuttings For EP Toxicity
MLDC-6	Drum Cuttings For EP Toxicity
MLSW-7	Supply Well No. 7

Site 2--Underground Waste Fuel Storage Area

Sample Location	Description
MUS B-1 (3'-5'), (8'-10'), etc through MUS B-11	Soil boring Samples
MU -1	New Shallow Monitoring Well
MU -2	New Shallow Monitoring Well
MU -3	New Shallow Monitoring Well
MU -4	New Shallow Monitoring Well

Site 3--Flightline Storm Drain Outfall

Sample Location	Description
	Surface Water Sample
MFSW-1	Surface Water Sample
MFSW-2	Surface Water Sample
MFSW-3	
MFSW-4	Surface Water Sample
MFSW-5	Surface Water Sample
MFSD-1	Sediment Sample
MFSD-2	Sediment Sample
MFSD-3	Sediment Sample
MFSD-4	Sediment Sample
MFSD-5	Sediment Sample

Site 4--Grassy Pond Annex Supply Well

Sample Location	Description
MGSW-10	Supply Well No. 10

7.7 Blanks, Knowns, Spikes, Splits and Duplicates

Additional sequence numbers (see Section 7.3) will be assigned to blind blank and blind duplicate samples. These blind samples will be clearly identified in the field log book but will not be identified as duplicates or blanks on the chain of custody forms.

8.0 DRILLING AND INSTALLATION OF GROUNDWATER MONITORING WELLS

This section outlines and discusses the details of all boring and monitoring well locations; drilling techniques and soil sampling methods; and well installation, completion and development procedures. Decontamination procedures are addressed in Section 11.1. Drilling, boring, sampling, and well installation efforts will be performed at both the Southwest Landfill (Site 1), and the Underground Waste Fuel Storage Area (Site 2).

8.1 Drilling and Boring

Work will be accomplished using two drilling rigs, one at each site. A large truck-mounted rotary drilling rig (such as a Speedstar 15S or CME-55) will be used at Site 1 due to the depth of some of the new wells to be constructed. A smaller trailer-mounted rig (such as a DeepRock RAM) will be used at Site 2. Both rigs will be equipped to perform the same work, but with varying torque capacity, etc. Upon completion of one site, that rig will continue work at the other site to assist in timely completion of the project. A qualified CH2M HILL hydrogeologist will be assigned to each rig to oversee geotechnical operations, conduct soil sampling and monitoring, perform hydraulic testing, and otherwise document that all work performed is consistent with the project specifications. The Project Hydrogeologist will also be on-site during the field work activity.

Drilling and well installations will be performed in accordance with the details outlined below, and at the approximate locations indicated in Figures 11 and 12. Exact well locations will be determined in cooperation with base personnel, as discussed in Section 3.1. Site 2 involves both the installation of temporary wellpoints and permanent monitoring wells. In all cases, boring, sampling and well

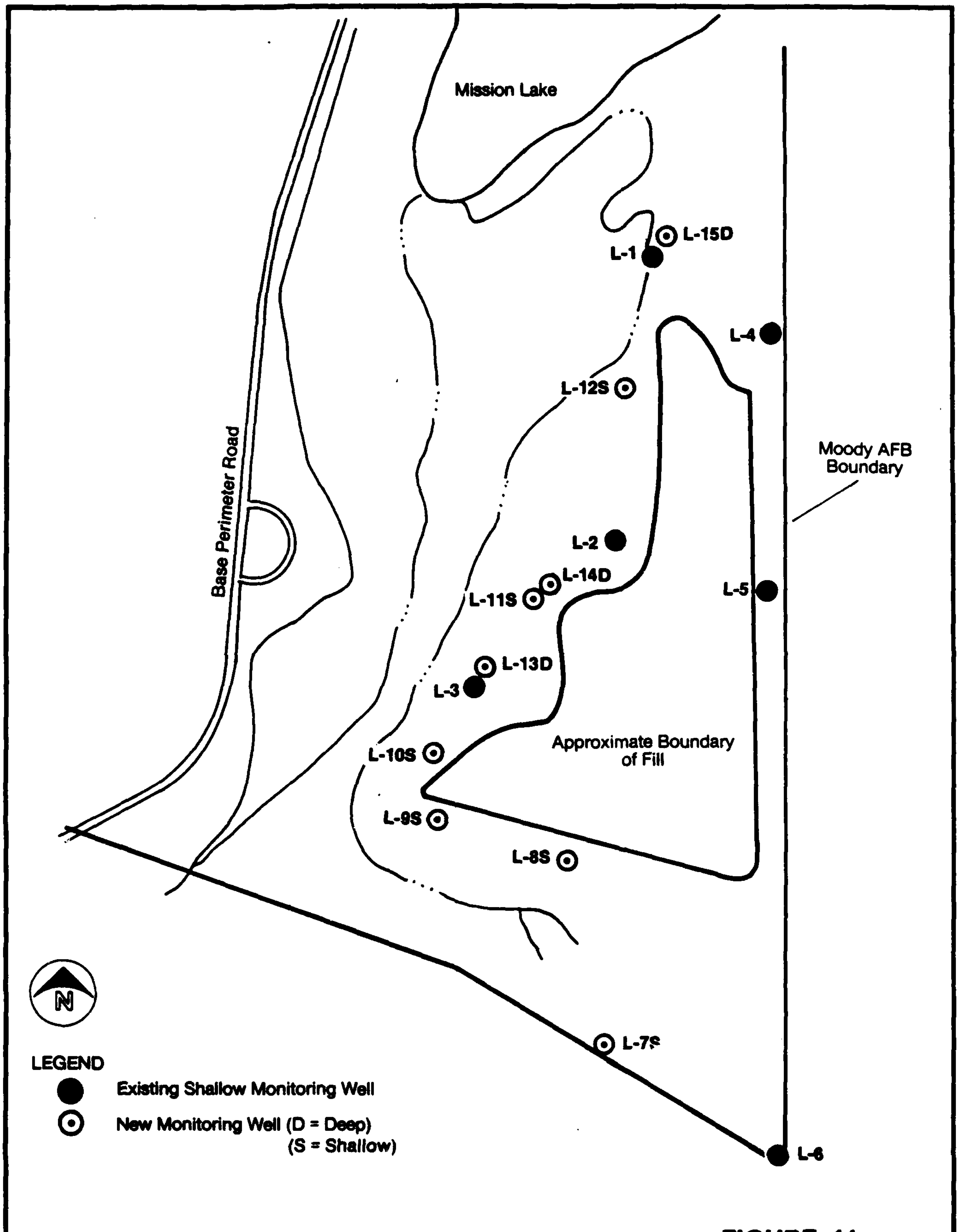

FIGURE 11.
Monitoring Well Location Map. Southwest Landfill Site,
Moody AFB, Georgia.

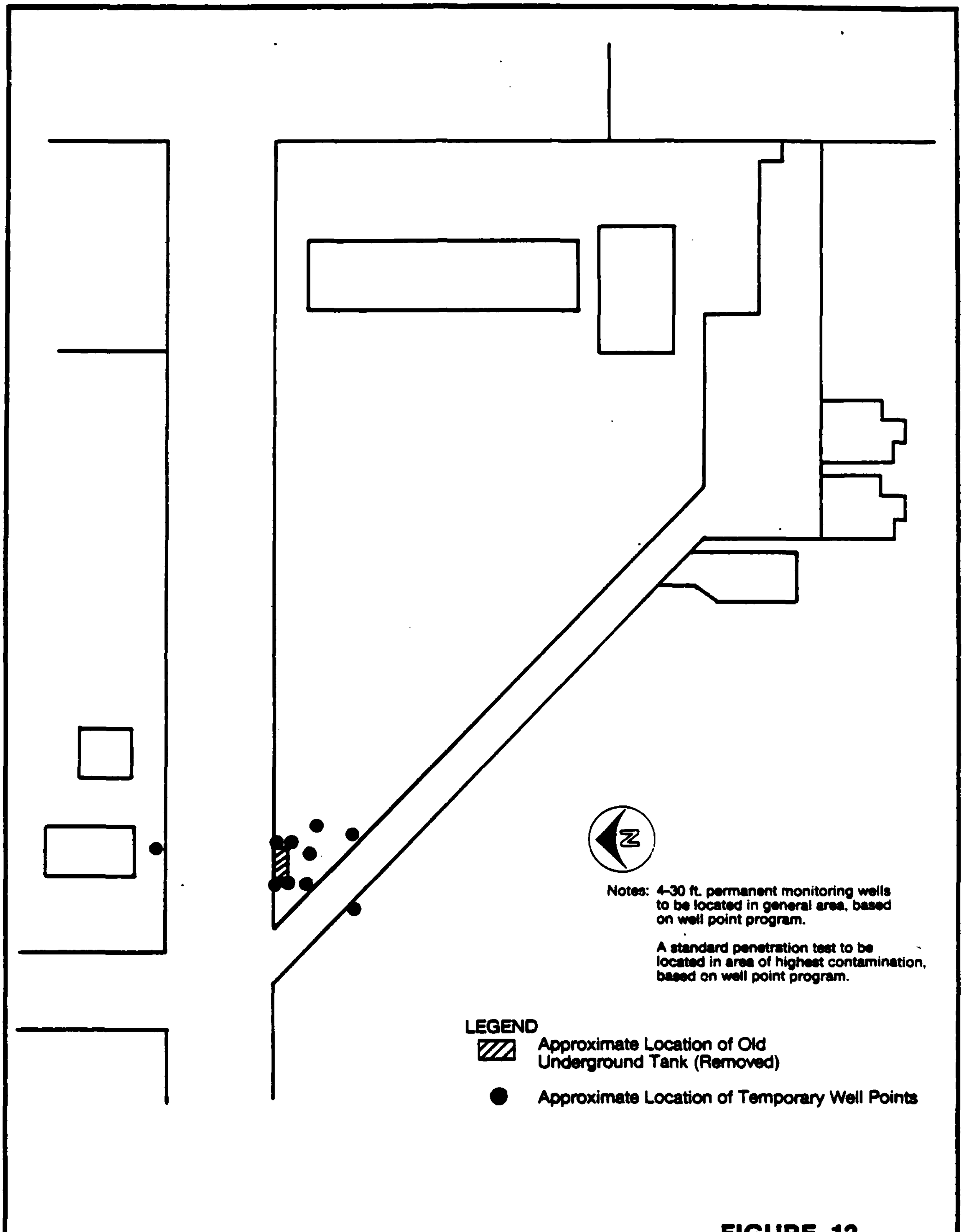

FIGURE 12.
Temporary Well Point Location Map. Underground Waste Fuel Storage Area, Moody AFB, Georgia.

installation will be accomplished using decontaminated hollow stem augers.

8.2 Soil Sampling and Monitoring Well Construction

The procedures involved with soil boring, sampling and monitoring well installations will generally be the same at both sites. Site 2 will have some variations involved, since temporary wellpoints are to be installed and removed, and a Standard Penetration Test boring will be completed. Samples are generally to be obtained at 5-foot intervals in all borings.

Each monitoring well will be constructed according to the following specifications developed by OEHL:

- There will be a total of 13 monitoring wells installed at the appropriate locations indicated in Figures 11 and 12. Site 1 will have six shallow wells and three deep wells installed. Site 2 will have four shallow wells installed. Shallow wells will be finished to a maximum depth of 30 feet below land surface. Deep wells will be finished to a maximum depth of 100 feet below land surface, or to the top of the primary clay confining zone, whichever occurs first. Wells will be installed from the least contaminated areas towards the most contaminated areas, as estimated from existing information.

- All wells will be constructed of 2-inch (inside diameter) Schedule 80 PVC casing and screens, using flush-threaded, screw-type joints only. Typically, 10-foot casing and screen lengths will be used. Wells will be properly fitted with a bottom cap, and a threaded top cap having a 1/16-inch breather hole.

- The bottom 10-feet of all wells will be screened with 0.010-inch machine slotted PVC screens. Size 20/30 silica sand will be backfilled from the borehole bottom to a minimum 2-foot height above the top of the well screen. A minimum 2-foot thick bentonite seal will be placed above the gravel pack, followed by grouting to land surface with a Portland Type I cement.

- Other specifications regarding well construction details are described in Section 8.2.1.

8.2.1 Standard Sampling and Installation Procedures

- The CH2M HILL hydrogeologist will log the samples obtained. Samples will be placed in clean glass

jars labeled appropriately. Each sample will then be monitored for organic vapors, away from the influence of the drill rig exhaust, borehole, and other samples. The average organic vapor levels will be recorded and the samples properly stored for delivery to the BCE.

- Where visual observations or organic vapor levels indicate potentially hazardous materials, cuttings from these areas will be containerized in new, covered 55 gallon drums for sampling at a later time. The CH2M HILL hydrogeologist will number the drums and maintain an inventory of the drum contents.

- During boring and sampling, the CH2M HILL hydrogeologist will also monitor organic vapors and oxygen levels in the breathing zone (away from the drill rig exhaust), and the lower explosive limit over the borehole. These values will generally be checked at the end of advancing each new auger flight and recorded. (Refer to specific Attachment A for Health and Safety procedures.)

- Hollow stem augers will have an appropriate outside diameter for the well construction specified. The first auger will be advanced to a depth of about 3 feet. The hollow stem will be cleaned out using a drill rod and flushing with potable water obtained from the base.

- A 24-inch long split-spoon sampler will then be attached to the drill rod and placed back into the hollow stem to the appropriate depth. A sample of the subsurface material below the auger will then obtained with the sampler by driving the drill rod with blows from a 140-pound hammer dropping 30 inches. The sampler will be removed and opened, and a representative sample will be obtained from the middle of the core.

- The next length of auger will be connected, pinned, and advanced 5 feet. The above procedures to clean out the hollow stem and obtain a sample will be repeated. The hole will be advanced to total depth by repetition of these procedures.

- The above steps are repeated until the last sample, just beyond the desired monitoring well depth, is obtained. Following completion of boring and sampling, the inside of the borehole will be cleaned out, using drill rods and potable water to flush materials to the surface.

- Following completion of the borehole, the monitoring well will be constructed with the augers holding the hole open. The well will be constructed in 10-foot segments and incrementally lowered down into the hollow stem until the desired well depth is achieved. Gravel packing will then be added using a small diameter PVC pipe to assist in packing distribution. As the gravel pack height increases, the augers will be slowly withdrawn in stages and flights disconnected. This process will continue until the desired gravel pack height above the screen is obtained. Bentonite will then be added to the desired thickness (using pellets to the extent practicable).

- Once the bentonite is placed, the augers will typically be withdrawn from the hole. This assumes that the hole will remain open. At this point, the hole will be grouted with a tremie pipe to land surface (or near land surface where flush-mounted valve boxes are used). Grout will be mixed at the site in a 55 gallon drum and pumped out. Grouting will be accomplished with the augers in place if formations exist where caving of the hole may be a problem.

- Following completion of grouting, the well will be fitted with a protective locking casing and cement pad, or a flush-mounted standard valve box and locking cap. At Site 1, protective casings will be used on all nine wells. As one alternative, the casings may be a 5-foot length of circular, 4-inch diameter steel. The bottom would have three 1-foot-long stabilizer bars welded to the outside of the casing. Other alternative types of protective casings are available and the most cost-effective type will be utilized. The bottom 2 feet (approximate) of the casing will be set into the borehole grout. A 2-foot by 2-foot by 4-inch concrete surface pad will then be poured around the protective casing. The casing will have a hinged top that has a lockable clasp. At Site 2, all wells will be fitted with a standard 8-inch valve box. The box will be set into the borehole grout, at an inch or two above existing grade to minimize stormwater entry through the valve box lid. A concrete pad is then poured around the valve box and sloped away towards land surface. The wells will be fitted with lockable caps.

8.2.2 Temporary Wellpoints--Site 2

Ten temporary wellpoints will be installed at Site 2, at the approximate locations shown in Figure 12. The purpose of the wellpoints will be to assess hydrocarbon contamination in the general area, which may gave resulted from past leakage of an old underground JP-4 fuel tank; to better estimate the primary direction of shallow groundwater flow; and to assist in locating one upgradient and three downgradient monitoring wells at the site. It will be necessary to remove the wellpoints after data collection activities are completed.

The temporary wellpoints will be constructed according to the following specifications and procedures:

- Wellpoints will be installed from the probable least contaminated areas to the probable most contaminated areas, based on estimated direction of groundwater flow.

- Decontaminated hollow-stem augers having an appropriate outside diameter for the wellpoint construction specified will be used. The method of advancing the augers, obtaining subsurface samples, and monitoring will be identical to those specified in Section 8.2.1.

- The borings will be advanced to two feet below the soil/water interface existing at the time of installation, not to exceed a depth of 20 feet below land surface.

- Temporary wellpoints consisting of 2-inch slotted PVC screen sections screw-threaded together will be placed through the hollow stem. The auger will be withdrawn and soils allowed to collapse around the wellpoints. The wellpoint riser casing will extend about 1 foot aboveground and have a push-on PVC cap.

Water levels in the wellpoints will be allowed to stabilize for a minimum 24-hour-period. The top of casing elevations will be established by CH2M HILL based on an arbitrary TBM. Wellpoints will then be checked by CH2M HILL for water level, floating product thickness, and organic vapors.

Based on this information, permanent monitoring wells will be located. One well will be located hydraulically upgradient from the old tank site. Two wells will be located at the primary downgradient edge of a floating product plume (if present), or the highest area of dissolved

contamination (based on the organic vapor readings). One well will be located approximately 100 feet from the primary downgradient edge of contamination.

Following these determinations, the wellpoints will be removed. This will involve the pulling out the PVC wellpoints, the placement of bentonite from the bottom-most portion of the remaining open hole to approximately 1 foot below land surface, and the placement of a grout cap to land surface. A section of rebar will be paced in the center of the grout cap to mark the boring locations. The rebar will extend about one inch above land surface.

8.2.3 Standard Penetration Test Boring

One detailed boring is to be performed at Site 2 in the area of highest probable contamination, based on results obtained from the temporary wellpoint installations (see Section 8.2.2.). The boring will be advanced by continuous Standard Penetration Testing, conducted pursuant to ASTM D-1586.

In procedure, this boring will generally be similar to other borings, using a hollow stem auger to advance the depth. However, sampling will be done continuously using a decontaminated split spoon sampler each time (refer to Section 10.0 for decontamination procedures). The augers are advanced only the length of the sampler, and the sampler is always sampling ahead of the augers. The split spoon sampler is driven by a 140-pound hammer falling 30 inches. The number of hammer blows (blow counts) to drive the sampler 6 inches are recorded and the standard penetration test result is the number of blow counts required for the last 12 inches of driving. Samples will be logged and monitored by CH2M HILL as described in Section 8.2.1. Up to four soil samples through the profile will be selected on the basis of organic vapor readings, and submitted for characterization of hydrocarbon contamination. The borehole will be plugged with bentonite and a grout cap provided, along with a rebar placement.

8.3 Well Development

Each new monitoring well will be developed (refer to Section 6.2.1) following completion of construction. The method of well development will depend to some degree on groundwater (and subsurface permeability) conditions existing at the time of installation. Development may be done by pumping with an aboveground centrifugal or a submersible pump, air lifting, surging, a manual pitcher pump or a combination of these methods. In all cases, wells will be developed until water yielded from the wells is as clear and free of sediments as possible. Rigs will be equipped to develop wells by the method necessary.

Pursuant to the OEHL direction, development water will be discharged onsite. Water will be discharged away from the well and in a manner such that transfer of potential contamination to a previously clean area is minimized. Additional detail regarding development procedures is as follows:

- o Above-ground pumping is limited by the height of static lift required. Submersible pumping is currently limited by finding a cost-effective, reliable pump for a 2-inch diameter well.

- o Air lifting involves use of an air compressor and tubing to blow air down the well. This surges the water level throughout the screened section. It is possible to evacuate water from the well in this manner.

- o Surging involves the use of surge blocks. Surge blocks are typically fabricated of metal washers and rubber belting to form a circumferential disk slightly smaller than the well diameter. This is fitted to the drill rod and moved up and down the screened interval of the well, causing a surging action. Surge blocks can also be fabricated from a closed PVC cylinder containing water or sand on the inside. This is manually lowered and raised along the well screen interval to accomplish a surging effect.

8.4 Geophysical Logging

As rotary drilling techniques will not be utilized in the site investigations, the requirements in the OEHL SOW for running an electric log in the borehole is not applicable. No other use of surface or downwhole geophysical equipment is required or anticipated for the project.

9.0 PUMP TEST

No full scale pumping tests are required or scheduled for the project. As described in Section 6.2, in-situ field tests for estimating hydraulic conductivity will be performed in the 13 new monitoring wells to be installed at both Sites 1 and 2. Also, as discussed in Section 6.2, flow rate, specific capacity, temperature, conductivity, and pH will be measured during well development where feasible.

10.0 GROUNDWATER MONITORING AND WATER QUALITY SAMPLING

This section outlines and discusses procedures to be followed in monitoring and sampling activities, and the types of water quality analyses to be performed (pursuant to Table 1 in the SOW). Decontamination procedures are in Section 11.0.

10.1 Groundwater Level Measurement

This involves measuring the groundwater table depth. This will be accomplished through the use of a decontaminated standard steel surveyor's tape or a decontaminated electronic water level indicator, held from an exact location on the top of casing where NGVD elevation has been established. Measurements will be made to the nearest 0.01 foot.

Where measurement of a floating hydrocarbon layer is possible (i.e., Site 2), water levels (and thickness of product) will be measured with a decontaminated steel tape using the Petroleum Paste tape method. This method involves coating the steel tape with two pastes; one which reacts with hydrocarbon and one which reacts with water. The difference in depth to the top of the two different layers is the thickness of the upper, floating hydrocarbon layer. Also, use of a decontaminated Teflon® bailer may be utilized to establish relative product thickness. Water levels will be corrected (approximately) by using a specific gravity of 0.8 for JP-4 fuel. This value will be multiplied by the product thickness (in feet) and added to the measured water surface elevation.

10.2 Surveying of Wells, Borings, and Sampling Locations

The SOW requires permanent markers and horizontal location of all new monitoring wells, boreholes, and sampling points. It also requires establishing the vertical elevation of all new wells. These requirements will be met using CH2M HILL surveying staff.

A permanent baseline and benchmark will be established at each site, to perpetuate the horizontal location of pertinent points. Baseline points will be iron rebars with a clearly marked centerpoint. All horizontal coordinates will be local in nature and based on magnetic bearings. The horizontal position relative to the baseline of pertinent points located will be within 0.5 feet of their true position.

All pertinent elevations will be tied to National Geodetic Vertical Datum, based on the most convenient point of known NGVD to be established prior to the survey (refer

to Section 3.1). Elevations will be set at a point (to be permanently marked) on the north side of the top of casing for new monitoring wells. Relative elevations between wells shall be established within 0.01 foot; the elevations shall be within 0.03 foot of their true elevation.

Where practicable and convenient, the NGVD top of casing elevation will be re-established for some existing monitoring wells as a cross-check.

10.3 On-site Analyses

This involves the use of field instruments to initially characterize water quality conditions prior to sampling. (Use of organic vapor detectors during drilling operations is outlined in Section 8.2.1). This includes measuring the pH, specific conductance and temperature of the water during development of monitoring wells, pre-sampling purge of monitoring wells, and obtaining surface water quality samples.

10.4 Sampling for Off-site Analyses

This subsection describes the procedures to be used in obtaining representative samples of groundwaters, subsurface soils, surface waters, sediments, and drummed soil cuttings. Decontamination procedures are outlined in Section 11.0.

For all analyses involving volatile organic compounds, sample vials will be completely filled in such a manner as to eliminate air bubbles within the vials after capping. A ten percent air space will be left in all other sample containers.

Field, duplicate, and quality assurance samples (i.e., bailer blanks) collected will be forwarded to the CH2M HILL Gainesville laboratory on a daily basis via Federal Express. Properly labeled split samples are required in the SOW and these samples will be delivered to the appropriate base location, on a daily basis. Base personnel will select ten percent of the split samples for analysis at the USAF OEHL in Brooks, Texas, and package the selected samples for shipment. CH2M HILL field personnel will ship the packaged samples to OEHL on a daily basis, via Federal Express. Sample shipments must include an OEHL Form 2752A and/or 2752B.

Sample container preparation, sample preservation, sample handling, and chain of custody procedures are outlined in other sections of the TOP.

10.4.1 Sampling of Groundwater Monitoring Wells

Upon arrival at each monitoring well location, the well water level will be measured (see Section 10.1). Following this, the wells will be purged a minimum of 3 to 5 well volumes or until the pH, conductivity, and temperature stabilizes (per criteria contained in the SOW). Pre-sample purging will involve the use of an above-ground centrifugal pump, stainless steel bailer, or manual pitcher pump. Where well recovery is slow and purging evacuates the entire well, the amount of additional purging (if any) required for that well will be based on the sampler's experience.

Water samples will be obtained with an all-Teflon® bailer. Before sampling, the bailer will be decontaminated and bailer blanks (using deionized water) obtained as required. Two bailers of well water will be collected and wasted. A third bailer will be collected and transferred to the appropriate sample bottles where possible (including a split sample from the same bailer water). Procedures for obtaining split samples are also addressed in Section 12.1. Where low yield wells are involved and the bailing evacuates the well, a sample will be collected when the water level has recovered enough to fill the bailer. Where floating hydrocarbon are present, a sample of the water phase below the product will be obtained using a decontaminated "thief" type sampler.

At the Southwest Landfill Site (Site 1), all nine new monitoring wells will be sampled. Additionally, existing wells L-1, L-2, and L-3 will be sampled. Samples are to be analyzed for halogenated volatile organics, aromatic volatile organics, extractable priority pollutants, some priority pollutant metals, total dissolved solids, and arsenic.

At the Underground Waste Fuel Storage Area, the four new monitoring wells will be sampled. Samples are to be analyzed for petroleum hydrocarbons and aromatic volatile organics.

All data will be recorded in a field book for formatting and reporting in the Phase II report. Field notes will include, but not limited to, the well number; time and date of sampling; water level (and product thickness if applicable); depth of well; duration and volume of pre-sample purging; on-site water quality measurements; type of sample; preservatives used; and sampler signature.

10.4.2. Sampling of Moody AFB Water Supply Wells

Two water supply wells are to be sampled. Well No. 7 is located southeast of Mission Lake (see Figure 13). Well

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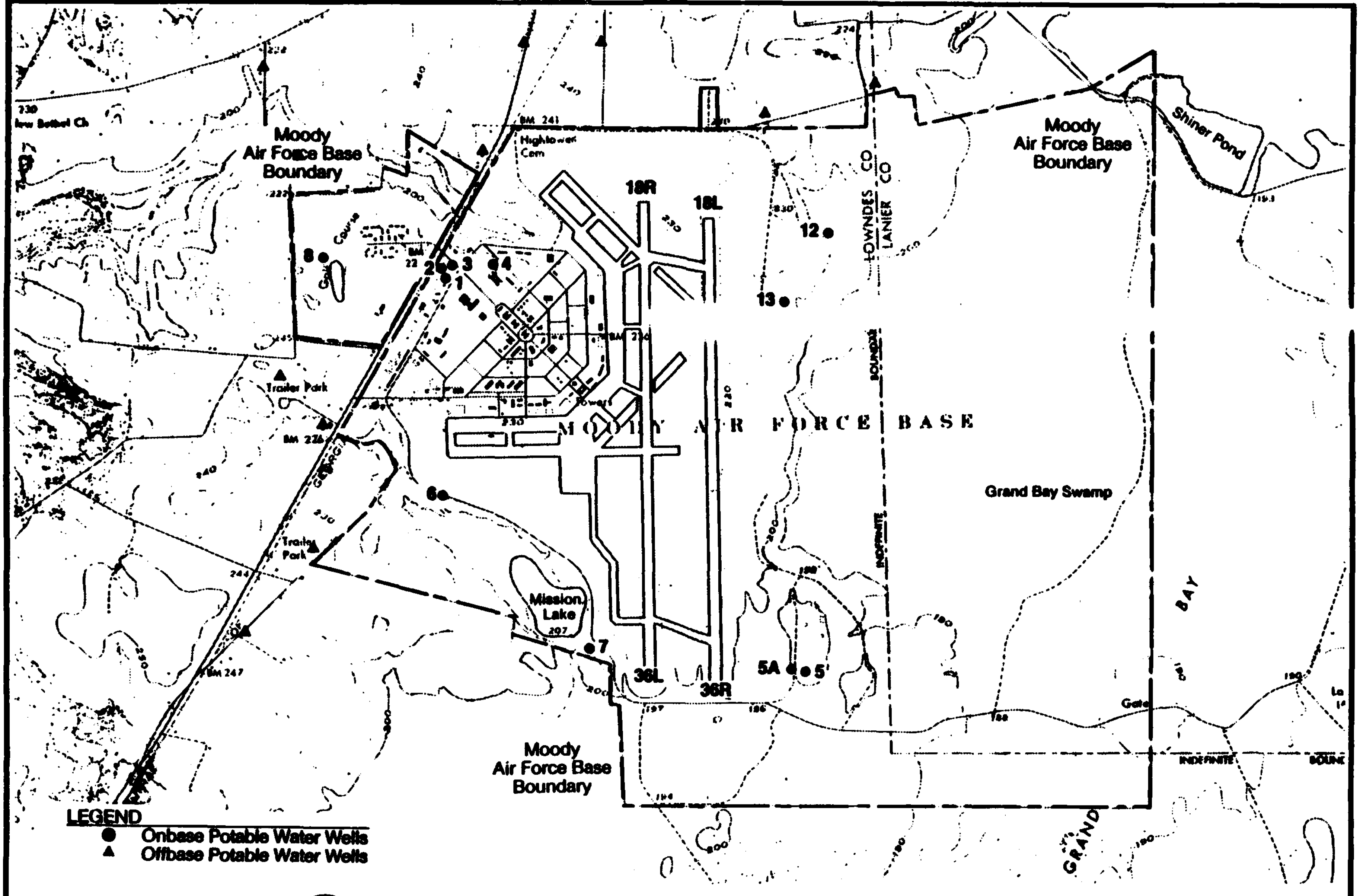

FIGURE 13.
Location of Water Wells at Moody AFB, Georgia and Vicinity.

No. 10 is located at the Grassy Pond Annex. Arrangements will be made with base personnel to have these wells pumped one day prior to sampling, if these wells have been inactive. Sampling ports will be opened and allowed to flush for several minutes prior to collecting the samples. Samples from Well No. 7 are to be analyzed for the same parameters as the monitoring wells at Southwest Landfill. Samples from Well No. 10 are to be analyzed for halogenated and aromatic volatile organics.

All data will be recorded in a field book for formatting and reporting in the Phase II report. Field notes will include, but not be limited to, the well designation; time and date of sample; type of sample; duration and volume of pre-sample purging; preservatives used; and sampler signature.

10.4.3 Sampling of Subsurface Soils

This involves obtaining up to four samples from the Standard Penetration Test boring to be located and performed at the Underground Waste Fuel Storage Area (refer to Section 8.2.3). Samples to be submitted for analyses (including split samples) will be selected on the basis of organic vapor readings and sampler observations, and taken from the middle of the sample core. Samples are to be analyzed for aromatic volatile hydrocarbons and petroleum hydrocarbons. Depths of the samples retained for chemical analyses will be shown on the completed boring log to be provided in the Phase II report.

10.4.4 Surface Water and Sediment Samples

This involves obtaining five water samples, and five sediment samples from the Flightline Storm Drain Outfall. The approximate locations where samples will be obtained are shown in Figure 14. Downstream samples will be collected first. Water samples will be obtained before sediment samples at each location. A rebar will be driven into the bottom of the watercourse where water and sediment samples were obtained.

Surface water samples will be obtained from mid-depth location using a decontaminated all-Teflon® bailer (and collecting bailer blanks as required). Where water depth makes use of the bailer impractical, a clean glass container will be utilized. On-site water quality characterizations will be made during the sampling process. In either case, two containers of water will be collected and wasted. A third container will be collected and transferred to the appropriate sample bottles where possible (including a split sample from the same container water). Procedures for obtaining split samples are also addressed in Section 12.1.

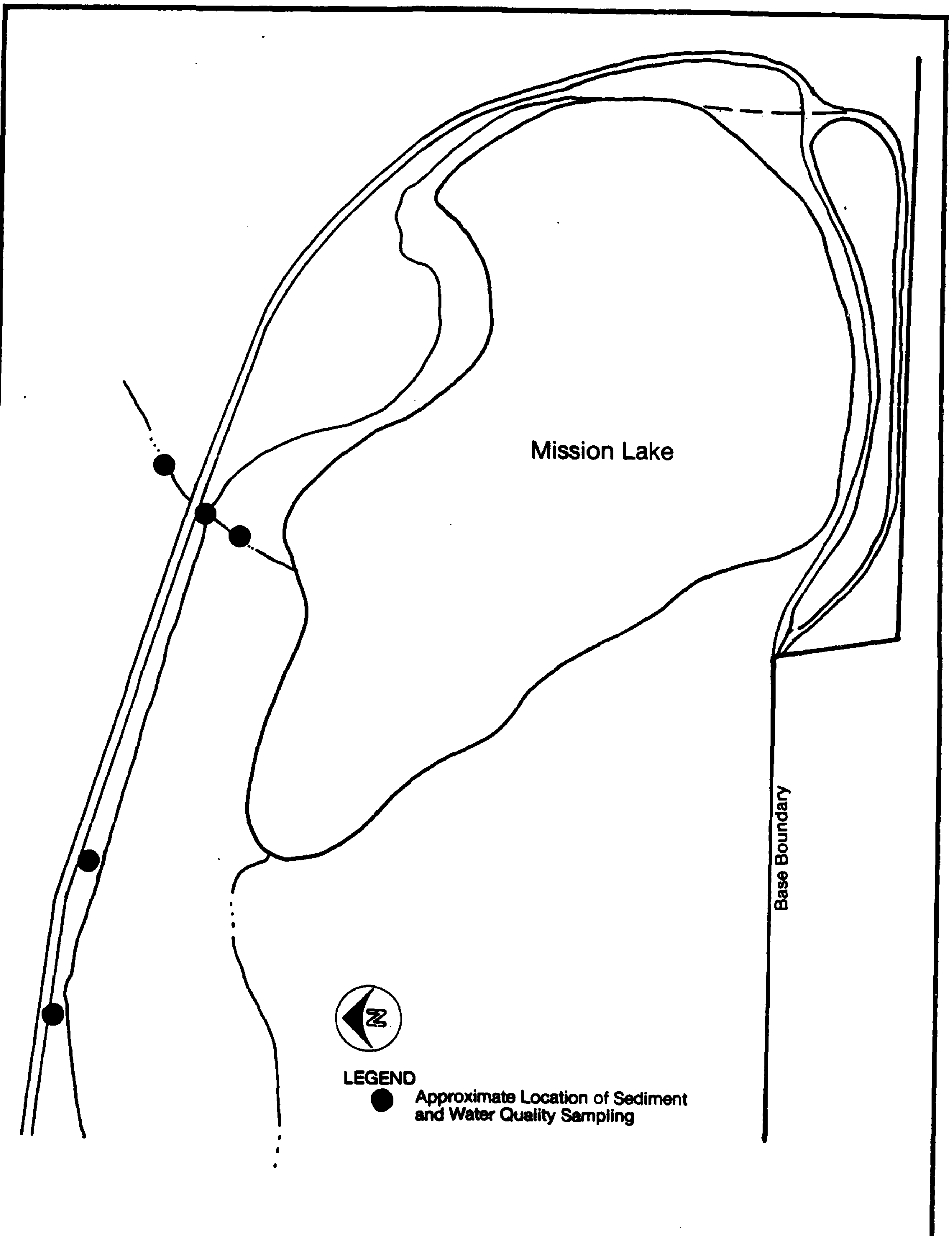

FIGURE 14.
Sampling Locations, Flightline Storm Drain Outfall Site, Mood AFB, Georgia.

Sediment samples will be obtained from the upper six inches of bottom material at the specified location. Depending on conditions encountered, samples will be obtained using a hand auger, a telescoping device which firmly holds a clean glass jar for sweeping through the bottom sediments, or by driving a piece of aluminum tubing into the bottom to obtain a core sample. Sediment samples will be poured or extruded into appropriate sample containers (including a split sample from the same sampler of sediments).

Surface water and sediment samples are to be analyzed for halogenated and volatile organics; petroleum hydrocarbons; and lead.

All data will be recorded in a field book for formatting and reporting in the Phase II report. Field notes will include the sample location designation; time and date of sampling; sample type and method of sampling; on-site measurements or observations made; preservatives used; and sampler signature.

10.4.5 Drummed Soil Cuttings

This involves obtaining representative composite samples of soil cuttings (if any) deposited in drums during the drilling and boring work at Sites 1 and 2 (refer to Section 8.2.1). Up to six composite samples may be obtained, one from each drum (anticipated to involve a maximum of six). The sampler will notify the project manager if more than two drums contain cuttings and are sampled.

Composite samples will be obtained by pushing or driving a decontaminated aluminum tubing from top to bottom through the soil media, at the approximate center of the drums. The sample will be extracted onto aluminum foil. Small amounts of material will be scraped from along the length of the core using a stainless steel spatula, repeating the process until a sufficient quantity is obtained for sampling purposes. This material will then be mixed with the spatula and split evenly into the appropriate sample containers. Samples will be analyzed for EP Toxicity (metals).

All data will be recorded in a field book for formatting and reporting in the Phase II report. Field notes will include the drum number; time and date of sampling; any on-site measurements or observations made during sampling; preservatives used; and sampler signature.

11.0 DECONTAMINATION PROCEDURES

This section outlines and describes decontamination procedures to be used during all phases of the field work. Decontamination is emphasized to minimize crosscontamination of boreholes during drilling and to obtain as representative soil and water samples as possible.

All disposables such as laytex gloves, clothes, tyveks, etc. used in decontamination and health maintenance will be placed into a marked 55-gallon drum for disposal by base personnel (refer to Section 14.0 also).

11.1 Drilling, Sampling, and Well Installation

The base will designate a location for decontamination of all drilling equipment. The rigs and well materials will be decontaminated prior to start of work by steam cleaning. All downhole tools will be deconned prior to start of work and between installations by steam cleaning, rinsing with pesticide-grade isopropanol, and allowing to air dry.

Steam cleaning will involve the use of a portable AC adaptable "steam ginny". Isopropanol rinsing will involve use of a stainless steel, hand-held sprayer which is manually pressured. Downhole tools will be laid on sawhorses for cleaning purposes.

During the one standard penetration test boring at Site 2, split-spoon samplers will be deconned after every sample. This will involve (at a minimum) on-site steam cleaning of the samplers.

For health and safety purposes, laytex surgical gloves will be worn by field personnel during all work activity. For decontamination purposes, gloves will be changed at a minimum after every borehole completion (prior to well construction), before decontamination of equipment, and before start-up of the next boring.

11.2 Well Development and Testing

All pump suction lines, compressor air hoses, and surge blocks will be steam cleaned, isopropanol-rinsed, and allowed to air dry before using in each well development. Teflon® or stainless steel bailers (if used for this purpose) will be rinsed with isopropanol and deionized water, and allowed to air dry, before use in each well development. The bailer line, consisting of new, clean all-cotton or hemp rope, will also be replaced after completion of each well development.

All pressure transducers, cable lines, bailers or "slugs" used for in-situ well testing will be wiped down with clean cloths (or rinsed as appropriate) using isopropanol and deionized water, and allowed to air dry, before each down-hole usage.

Field personnel will wear laytex surgical gloves during all testing. Gloves will be changed following work at each site and prior to decontamination of equipment for next usage.

11.3 Water Level Measurements

Measurements during water quality sampling will be made with a standard steel surveyor's tape or an electronic water level indicator. (Use of pressure transducer systems during other phases of field work has been previously discussed.) The portions of equipment going down-hole will be wiped down with clean cloths using isopropanol and deionized water, and allowed to air dry, before each down-hole usage. Field personnel will wear laytex surgical gloves during measurements and sampling, which will be changed following work at each well site and prior to decontamination of equipment for next usage.

11.4 Water Sampling

All pump suction lines and bailers used for pre-sample purging will be wiped down with clean cloths (or rinsed as appropriate) using isopropanol and deionized water, and allowed to air dry, before each down-hole usage.

Water samples from wells will be collected with an all-Teflon® bailer. Before sampling, the bailer will be rinsed with isopropanol and deionized water and allowed to air dry. The bailer line, consisting of new, clean all-cotton or hemp rope, will be replaced after each well sampling.

Water samples from surface water sampling locations will be collected with an all-Teflon® bailer, or a new glass container where bailer use is not feasible. Either sample vessel will be decontaminated as per the above method for obtaining well samples.

Field personnel will wear laytex surgical gloves during all sampling work. Gloves will be changed following sampling at each site and prior to decontamination of equipment for next usage.

11.5 Sediment Sampling

Samples will be collected using either a hand auger, driven aluminum tubing, or a telescoping sampling device

which firmly holds a clean glass jar. Portions of the equipment which may contact the sediments will be rinsed with isopropanol and deionized water, and allowed to air dry, between each sampling location.

Field personnel will wear laytex surgical gloves during all sampling work. Gloves will be changed following sampling at each site and prior to decontamination of equipment for next usage.

11.6 Sample Handling

Sample containers for most analyses are purchased from a laboratory supply company who specializes in providing prepared laboratory-ready glassware. Containers with Teflon®-lined caps are utilized. As discussed in Section 10.0, specialized procedures are utilized to collect representative samples for some analyses.

Following sample collection and prior to packaging sample containers will be decontaminated. This involves rinsing the tightly-sealed containers with soapy water and then clean water, and drying the containers with an absorbent clean cloth or clean paper wiper.

12.0 SAMPLE HANDLING AND PACKING

Proper sample handling is an essential element ot the quality assurance program to minimize the potential for cross contamination and interference in the laboratory. Proper packing for shipment is essential to minimize breakage and leakage, and the resulting potential for cross contamination, as well as to comply with U.S. Department of Transportation hazardous materials regulations (49 CFR Part 172).

The following table contains the standard CH2M HILL requirements for sample containers, preservation techniques, and holding times. They are based on approved EPA criteria and are utilized by field personnel in water, soil and sediment sampling.

12.1 Split Sample Procedures

Where it is possible to do so, all samples will be split from a single full bailer. In cases where insufficient volumes can be obtained and with the exception of water volatile samples, all samples will be placed into clean, decontaminated containers of sufficient size to divide the contents into two separate sample containers. Before splitting, the sample will be thoroughly mixed to insure homogeneity. VOC samples will not be transferred

from one container to another due to potential losses of volatile components. Water volatile samples will be split from a single full bailer or if insufficient volumes is obtainable in a single bailer, successive bailers should be used. Soil and sediment volatiles will be split into two sample jars from a single, well mixed plug or sediment sample.

12.2 Sample Containers

A description of the required types of containers for handling the environmental samples after collection and prior to analyses is presented in the October 26, 1984 issue of the Federal Register (49 FR 43260, Table II). The information applicable to this project is listed in the table referenced above.

12.3 Sample Handling and Decontamination

After transferring the sample to the proper container, (and following completion of sample collection at each specific location) the sample container should be decontaminated, dried off, labeled and properly stored. After checking that the container is tightly sealed, rinse with soapy water, rinse with clean water, and dry the container with an adsorbent cloth or paper wiper. Proper safety procedures and disposal of decontamination wastes must be followed as applicable.

12.4 Procedures for Packing Low Concentration Samples

The EPA/DOT letter of agreement requirements for packaging low concentration samples specifies only that the samples be packaged to prevent breakage and leakage during transport. The procedures are:

12.4.1 Complete sample documentation.

12.4.2 Mark the sample level on each container.

12.4.3 Tape the drain plug of the cooler to prevent escape of liquid from the cooler.

12.4.4 Line the cooler with a large plastic bag.

12.4.5 Place approximately 1 to 2 inches of vermiculite in the bottom of the liner.

12.4.6 Place each sample container in a separate plastic bag and arrange upright in the bottom of the cooler.

12.4.7 Arrange ice packaged in small plastic bags or prepackaged coolant (blue ice) among the sample containers.

SAMPLE CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Sample Parameter	Container[a]	Preservation Technique[b,c]	Maximum Holding Time[d]
Metals (except Chromium (VI) and Mercury	P,G	HNO_3 to pH <2	6 months
Chromium (VI)	P,G	Cool to 40°C	24 hours
Mercury	P,G	HNO_3 to pH <2	28 days
Purgeable Halocarbons[g]	G, Teflon®-lined septum	Cool to 4°C 0.008% $Na_2S_2O_3$[e]	14 days
Purgeable Aromatics[g]	G, Teflon®-lined septum	Cool to 4°C 0.008% $Na_2S_2O_3$[e] HCl to pH <2[h]	14 days
Base/Neutral Extractables[g]	G, Teflon®-lined septum	Cool to 40°C 0.008% $Na_2S_2O_3$[e]	7 days until extraction, 40 days after extraction
Acid Extractables[g]	G, Teflon®-lined septum	Cool to 4°C 0.008% $Na_2S_2O_3$[e]	7 days until extraction, 40 days after extraction
TDS	P,G	Cool to 4°C	7 days

Table Notes

[a]Polyethylene (P) or Glass (G).

[b]Sample preservation should be performed immediately upon sample collection. For composite chemical samples each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then chemical samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.

[c]When any sample is to be shipped by common carrier or sent through the United States Mails, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table 6-1, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (NHO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).

[d]Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if data on file shows that the specific types of samples under study are stable for the longer time, and has received a variance from the U.S. EPA Regional Administrator. Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show that this is necessary to maintain sample stability.

[e]Should only be used in the presence of residual chlorine.

[f]Maximum holding time is 24 hours when sulfide is present. Optionally all samples may be tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.

[g]Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.

[h]Sample receiving no pH adjustment must be analyzed within seven days of sampling.

[i]When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding time procedure are noted in footnote e (re: the requirement for thiosulfate reduction of residual chlorine).

[j]For the analysis of diphenylnitrosamine, add 0.008% $Na_2S_2O_3$ and adjust pH to 7-10 with NaOH within 24 hours of sampling.

12.4.8 Fill the remaining space in the cooler with vermiculite, or other absorbent cushioning material and seal the large plastic bag.

12.4.9 Place any documents which are to accompany the samples in a plastic bag and tape to the underside of the lid to the cooler.

12.4.10 Close the cooler and seal both ends of the lid with evidence tape or custody seals. Then, wrap the cooler with glass or nylon reinforced tape to assure secure closer.

12.4.11 Affix to the outside of the cooler the address of the receiving laboratory, the return address, and "This End Up" labels on all four sides.

12.5 Procedures for Packing Medium Concentration Samples

The procedures for packing medium concentration samples are the same as for the low concentration samples except for more strict protocols of overpacking and hazard identification. Instead of Step 12.4.6 above, place the medium concentration sample, in its plastic bag, in an appropriately sized paint can in the bottom of which an inch of vermiculite has been placed; fill the rest of the can with vermiculite; and seal the can lid. Secure the lid with clips or reinforced tape, place "This Way Up" labels on the can and place in the cooler.

The can should also be marked with the appropriate classification from the DOT Hazardous Materials Table. The classification can be selected directly if the hazardous components or characteristics of the sample are known. Otherwise, a process of elimination to select the highest ranking hazard class in which the sample might belong should be followed. Although not anticipated for this project, the hazardous materials table found in 49 CFR 172 must be carefully examined to insure that there are no restrictions for shipment on passenger carrying aircraft. If restricted, the shipping container must be labeled "Cargo Aircraft Only."

Complete the packaging and sealing of the cooler as described above and label the cooler with the appropriate DOT hazard class label. Complete the shipper's certification and ship.

13.0 SAMPLE CUSTODY AND DOCUMENTATION

This section contains specific information concerning sample custody and documentation.

13.1 Sample Identification Documents

All samples will be identified and tracked by a combination of documents. Each sample will be tagged or labeled immediately after the sample container is sealed and decontaminated. An entry will also be made in the field log book to complete the description and identification of the sample, and provide information necessary to support analysis of the data from the laboratory. Chain-of-custody forms will be completed whenever custody is transferred to another person. Transfer may be made to another sampling team member, project team member, base POC representative, or shipping company. A packing list and label will be prepared whenever a sample or samples are packaged in a shipping container for shipment. The CH2M HILL laboratory sample custodian will log in all shipments and transfers of samples received by the laboratory. A unique sequential laboratory sample number will be assigned before distributing the sample to the chemist for analysis. The chemist will generate a report of the results of the analysis. In some cases, instrument recordings will also be generated. The chemist's reports will be assembled into a laboratory report. The laboratory report will correlate the laboratory identification number with the chain-of-custody entry and the field log book, to assign the appropriate sample identification number discussed in Section 7 above.

13.2 Chain-of-Custody Records

Sample custody in the field will be retained by the sampling team member(s) who collected the samples. The sample will remain in the actual possession or in view of the team member(s) until they have been placed in a designated secure area. Chain-of-custody forms will be filled out and signed by the sampling team member(s) who collected the sample whenever custody is transferred to another sampling team member, a project team member, a representative of the base POC, or a shipping company. The individual who receives the sample will sign and date the form also. Subsequent transfers will follow these same procedures. In the case of a custody transfer to a shipping company, the bill of lading will be attached to the chain-of-custody form accompanying the sample in lieu of a recipient's signature. The original of the two-part form will accompany the sample and the copy will be retained by the sampling team leader. Figure 15 is an example of the chain-of-custody form that will be used during the sampling program.

13.3 Field Log Books

Bound field log books will be issued to the sampling team for recording information such as the site name, date,

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CHAIN OF CUSTODY RECORD

PROJECT NUMBER	PROJECT NAME
LABORATORY	

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS											REMARKS

SAMPLED BY AND TITLE *(SIGNATURE)*		DATE/TIME	RELINQUISHED BY: *(SIGNATURE)*	DATE/TIME	RECEIVED BY: *(SIGNATURE)*
RELINQUISHED BY: *(SIGNATURE)*	DATE/TIME	RECEIVED BY: *(SIGNATURE)*	RELINQUISHED BY: *(SIGNATURE)*	DATE/TIME	RECEIVED BY LAB: *(SIGNATURE)*

REMARKS ______________________

SAMPLE SHIPPED VIA
☐ UPS ☐ BUS
☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

DISTRIBUTION: WHITE — ORIGINAL ACCOMPANIES SHIPMENT, PINK — COPY TO COORDINATOR FIELD FILES, YELLOW — CLIENT

FORM 340

FIGURE 15.
Chain of Custody.

CH2M HILL

time, sampling location, sample type (groundwater, surface water, soil, sediments), sampling equipment, sampling procedure, decontamination procedure, name(s) of sampler(s), the sample identification number, and analyses to be performed. Any additional or unusual information will also be recorded as appropriate. Such information may include volume of groundwater purged from monitoring wells, pH and conductivity measurements, color and/or odor of the sample.

13.4 Corrections to Documentation

Great care should be exercised to minimize corrections on sample documentation. If mistakes are made during the initial creation of the document, a new document should be initiated. If a mistake is made on sample documentation by subsequent handlers, the following procedure should be followed:

13.4.1 Line through the mistake in such a manner that the mistaken entry can still be read.

13.4.2 Enter the correct information.

13.4.3 Initial the changes.

13.5 Traffic Reports and Sample Labels

13.5.1 Traffic reports are required when an independent sample management office is responsible for management and distribution of samples. Since CH2M HILL will be responsible for sample collection and delivery of the samples to a CH2M HILL laboratory for analysis, the traffic reports are not required. All sample management procedures for this project will be performed through use of the chain-of-custody records, sample labels, and shipping container packing lists.

13.5.2 The sampling team will use labels or sample tags for initiating sample documentation. Date, time, sampling location, a sequential number and the sampler's signature will be recorded on the tag or label. The tag or label will be secured to each respective sample container immediately after decontaminating the container. The tag or label numbers will serve to identify the sample and will be recorded in the bound field log book along with information descriptive of the sampling conditions for that particular sample. An example of the sample tag or label that will be used is shown in Figure 16.

13.6 Shipping Labels

When samples are to be shipped by common carrier, they will be prepared for shipment in accordance with U.S.

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CH2M HILL

Gainesville Office
7201 N.W. 11th Place
Gainesville, FL 32605
PH. (904)377-2442

Client ______________________

Sample Description ______________________

Location ______________________

Analysis ______________________

Preservative ______________________

Date ____________ By ____________

CH2M HILL

Gainesville Office
7201 N.W. 11th Place
Gainesville, FL 32605
PH. (904)377-2442

Client ______________________

Sample Description ______________________

Location ______________________

Analysis ______________________

Preservative ______________________

Date ____________ By ____________

FIGURE 16.
CH2M HILL Typical Sample Label.

Department of Transportation hazardous materials regulations (49 CFR Part 172). Once the samples are properly packaged, the appropriate shipping documents will be prepared. For this project, all shipments will be either by company vehicle or by common carrier. The types of samples anticipated for this project will require the carrier's airbill and shipper's certification for restricted articles for medium concentration samples. No high concentration samples are anticipated. The forms are available from the carriers and are quite simple to complete.

14.0 SITE CLEAN-UP

The SOW for this Phase II effort involves no known sources of hazardous waste. It does not provide for the development and implementation of any remedial action plans in areas where contamination of any kind or level is found. As a result, "site clean-up" for the purposes of this TOP involves the policing of the sites where drilling, boring, well installation, or sampling was conducted as part of the specific SOW.

Site clean-up will be the primary responsibility of the subcontractor who provides drilling and boring services. The CH2M HILL agreement with the subcontractor will include provisions for returning each activity site to as near the arrival condition as practicable; for removing all rubbish, waste material or other associated debris from the sites, and for generally using reasonable care in avoiding unnecessary damage or destruction to vegetation and animals. Site clean-up will follow completion of associated subcontractor activities at a particular location.

Additionally, the subcontractor will be responsible for providing drums for the containerization of contaminated soil cuttings as necessary, and disposables from the site and decontamination activities, and the transport of these drums to a designated base location. Disposition of the drums and contents will be the responsibility of base personnel. CH2M HILL hydrogeologists assigned to observe the work will also be responsible for documenting that site clean-up meets the intent of the subcontractor agreement and the SOW.

CH2M HILL field personnel will be responsible for site clean-up following water and sediment sampling activities.

15.0 FIELD TEAM ORGANIZATION AND RESPONSIBILITIES

CH2M HILL utilizes a matrix organization. The principal components of the organization matrix are the

operating offices, each assigned responsibility for a geographical region and grouped into districts as appropriate, and the technical disciplines, organized along market or technical discipline lines. All personnel except district and regional managers and those assigned to the corporate staff are assigned to both a discipline and a region, one for technical guidance and development and the other for administration and day-to-day assignment.

The basic work unit is the project team. All other parts of the organization, and basically the matrix itself, exist only to provide this team with the resources, technical guidance, administrative and technical services, and facilities necessary for efficient, timely, and technically excellent project execution. Project teams may be comprised entirely of personnel from one regional office and a single discipline, or they may consist of personnel from several regional offices and many disciplines. Individuals may be a member of several project teams at any given time, or may be assigned to only one project for its duration, depending upon the time schedule, size, and complexity of the project. Therefore, a given individual may supervise a second individual on one project and, at the same time, be supervised by this second individual on another project. This is the advantage of the team concept, allowing efficient use of time and skills that would not be possible by any other system.

The project team for this project is comprised primarily of individuals assigned to the Gainesville region in several different discipline groups. One senior hazardous waste engineer in the Atlanta region is assigned to provide quality review of the work plans and products produced by this investigation.

15.1 Organization

The project team formed for this project is comprised of personnel from four divisions within CH2M HILL and three different regions. The primary effort will be conducted by personnel from the Gainesville region. The project manager is assigned to the Industrial Processes Division which also includes the laboratory. Primary support is provided by personnel from the Water Resources Division (hydrogeologists, geologists, and technicians). Surveying will be provided by the Civil Engineering Division. The Technical Services Division will provide computing services, word processing, reproduction, graphics production and editing. The Administration Division will provide contracting services, equipment rental, purchasing of supplies and travel services. A senior hazardous waste engineer in the Industrial Processes Division in Atlanta will provide quality reviews, and a specialist in our Reston, Virginia

office will review the health and safety plan. An organizational chart listing key personnel is given in Figure 17.

15.2 RESPONSIBILITIES

15.2.1 Roy Duke, Project Manager

The project manager is responsible for executing the project. This responsibility includes staffing, quality, scheduling and cost control. He is responsible for coordinating the work, liaison with OEHL, progress reporting, developing the work plan, and leading the project team.

15.2.2 Bill McElroy, Project Hydrogeologist

The project hydrogeologist is responsible for the field work associated with the project. This responsibility includes developing the drilling specifications, evaluation of responses from drilling companies, planning of field operations, supervising mobilization of drilling contractor and field hydrogeologists, coordination with base officials, securing necessary permits, and general supervision of drilling operations, field data collection, reporting and sampling.

15.2.3 Tom Emenhiser, Laboratory Manager and Site Safety Coordinator

As laboratory manager Mr. Emenhiser will be responsible for processing all samples requiring laboratory analysis. This responsibility includes planning and specifying sample handling and tracking procedures, scheduling of laboratory facilities and chemists, maintaining quality control procedures, and data reporting. As the site safety coordinator he will be responsible for writing and coordinating the site safety plan, checking that all field personnel have received the required safety training and are current in both training and physical examinations. He will provide site safety instructions to all field personnel and be available for site safety consultation during field operations.

15.2.4 Eric Meyer and Brian Painter, Hydrogeologists

The hydrogeologists will be responsible for supervision of the drilling operations at Moody AFB. They will also be responsible for field data collection during the drilling and well installation operations and for evaluation of safety conditions during drilling.

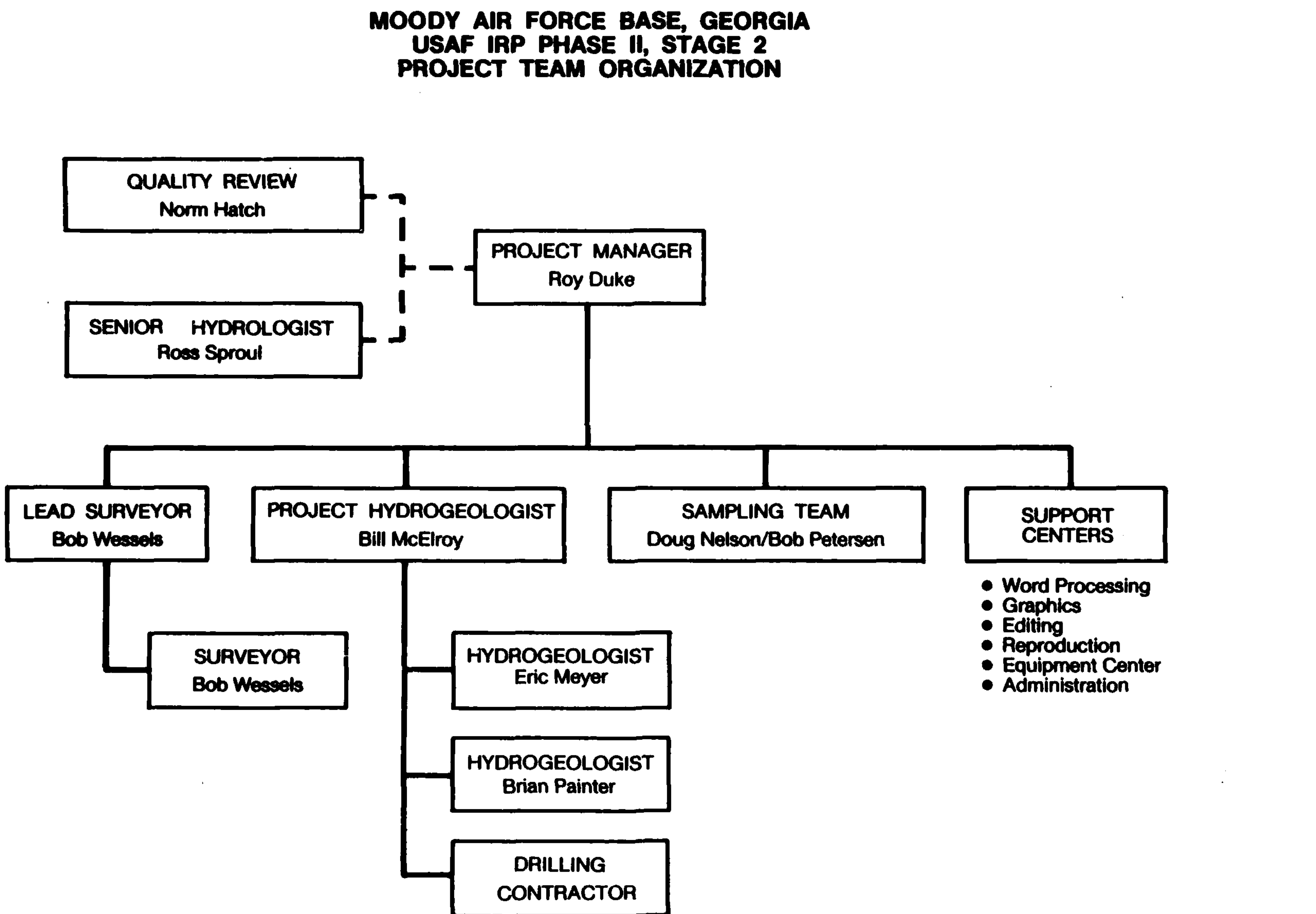

FIGURE 17.
Organizational Chart.

15.2.5 Kevin Flanagan and Bob Wessels, Surveyors.

The surveyors will be responsible for performing the field surveys to accurately locate the horizontal position and elevations of monitoring wells, borings and sampling points. This responsibility includes data reduction and production of the base map to be used in evaluation of the data.

15.2.6 Doug Nelson and Bob Peterson, Technicians.

Mr. Nelson and Mr. Peterson will be responsible for sampling of the monitoring and water supply wells and collection of the surface water and sediment samples. If any suspect material is found during drilling operations and temporarily stored in drums, they will also collect a composite sample from each drum for laboratory analysis. This responsibility includes preparation of all sampling equipment, packaging supplies, and field instruments. They will be briefed and will collect all samples in accordance with the sampling procedures outlined above. They will be responsible for labeling, tracking and shipping all samples to the CH2M HILL laboratory for analysis; for delivering the samples required by the SOW to the base POC; and for shipping the samples selected and packaged by the base POC to OEHL.

15.2.7 Norm Hatch, Quality Review.

Mr. Hatch will be responsible for reviewing the project plans, proposed procedures and evaluations to provide an independent evaluation of the technical approaches and data evaluations made by the project team. He will also provide consultation service to the project team during the evaluation and interpretation of the data.

15.2.8 Ross Sproul, Senior Hydrologist.

The senior hydrologist is responsible for reviewing the plans and procedures proposed by the lead hydrogeologist for technical soundness and to provide consultation service to the hydrogeologists during the field work and during the evaluation and interpretation of the data.

15.3 TRAINING

All project team members will be briefed on the overall objectives of the project and the requirements of the SOW, Site Safety Plan and TOP. Each team member will be provided a copy of the SOW, TOP and Site Safety Plan. In addition, each team member will be provided written instructions regarding their specific assignment, the man-hours allocated to the tasks assigned and pertinent reporting and administrative procedures.

All personnel assigned to the project team for field work are experienced personnel who receive regular training on health and safety procedures, quality control procedures, and technical subjects appropriate to their discipline. All key personnel assigned to this project and most of the field personnel have experience working on USAF IRP Phase IV projects and are familiar with USAF base security requirements and protocols.

16.0 SCHEDULE

The schedule for the Phase II activities covered in the SOW is shown in Figure 18.

Contract No. F33615-85-D-4335
Task Order No. 2
IRP Phase II, Confirmation/Quantification (Stage 2)
Moody AFB, GA

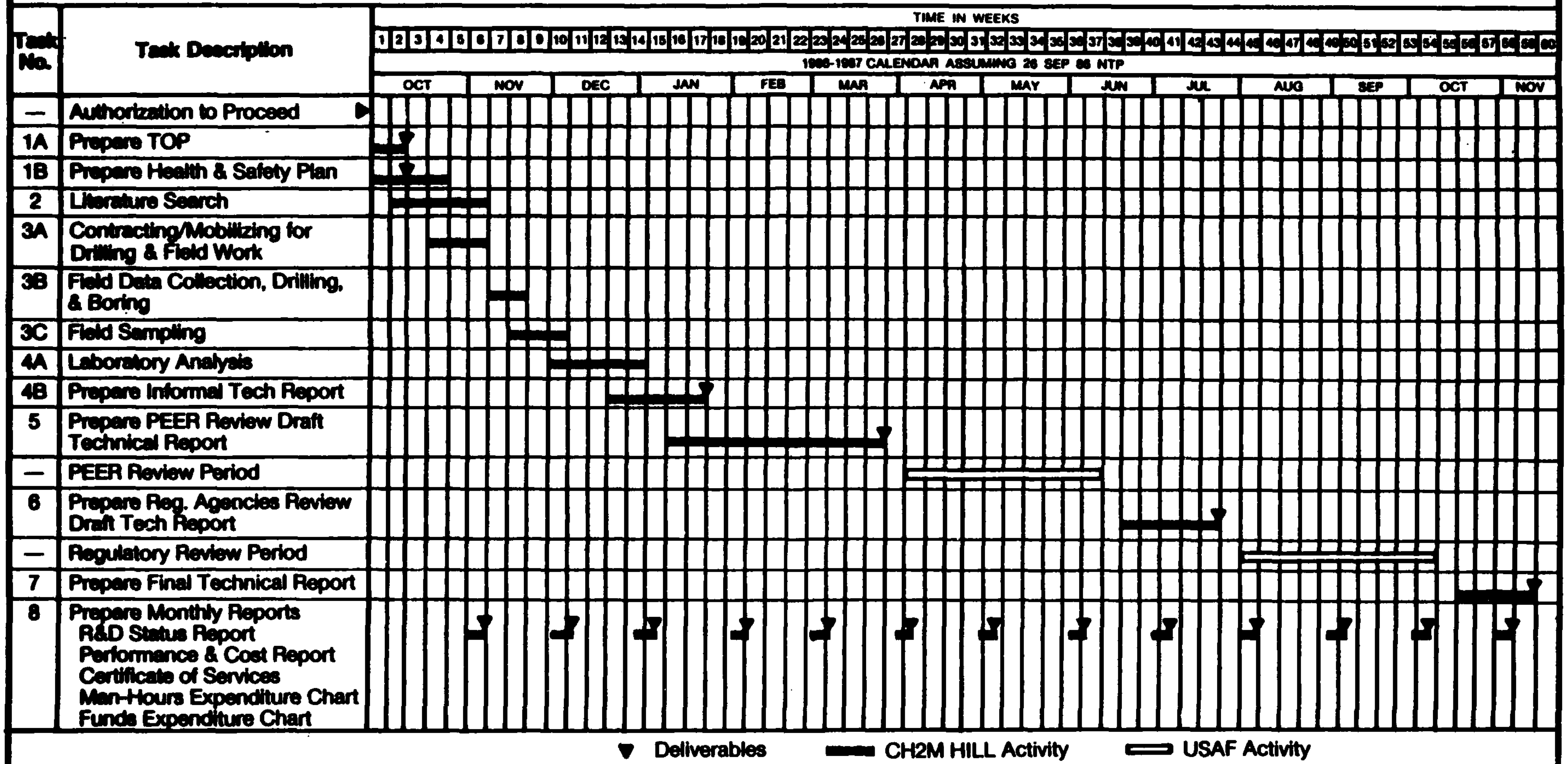

FIGURE 18.
Project Schedule.

CH2M HILL

SITE SAFETY PLAN FOR FIELD INVESTIGATIONS

I. GENERAL INFORMATION

CLIENT: U.S.A.F.--OEHL, GN21222.C0

PROJECT MANAGER: Roy Duke/GNV

SITE: Sites 1 through 4 as described below

SITE LOCATION: Moody Air Force Base, Georgia

PURPOSE OF FIELD VISIT(S): Site characterization; installation of shallow temporary well points and monitoring wells; and collection of groundwater, surface water, and sediment samples.

DATE OF VISIT(S): November 1986 - December 1986

BACKGROUND INFORMATION: Complete ____ Preliminary X

INFORMATION AVAILABLE FROM: GNV (office)

OVERALL HAZARD SUMMARY: Serious ____ Moderate ____ Low X Unknown ____

II. SITE/WASTE CHARACTERISTICS

FACILITY DESCRIPTION

Moody Air Force Base is located in Lanier and Lowndes Counties, Georgia, approximately 10 miles northeast of Valdosta, Georgia. The main installation covers approximately 5,160 acres. The base is operated by the Tactical Air Command and the 347th Tactical Fighter Wing.

The base sites earmarked for investigation are shown in Figures 1 and 2 and described below.

- Site 1. The Southwest Landfill occupies approximately 30 acres along the southwest corner of the base boundary. Activity at the site started in 1955 and continued until 1972.

The entire area was reported to consist of trenches about 14 feet deep, filled with general base refuse. A small quantity of low level radioactive waste (electron tubes) was reportedly buried at the site, however, the exact location is unknown. No large quantities of hazardous wastes were reportedly disposed of at the landfill; however, small quantities of oil and waste solvents are suspected.

- <u>Site 2</u>. The Underground Waste Fuel Storage Area is a suspected spill site for JP-4 fuel.

- <u>Site 3</u>. The Flightline Storm Drain Outfall receives stormwater runoff from the flightlines. Contaminants anticipated to be encountered are components of hydraulic fluids and JP-4 fuel.

- <u>Site 4</u>. Several water supply wells are located at the Grassy Pond Annex. This is a recreational annex located about 25 miles southwest of Moody AFB, approximately 3 miles north of the Florida/Georgia state line. One groundwater sample will be collected from Supply Well 10 for chemical analysis.

<u>STATUS (ACTIVE, INACTIVE, UNKNOWN)</u>:

- Site 1--Inactive
- Site 2--Inactive
- Site 3--Active
- Site 4--Active Supply Well

<u>HISTORY (WORKER OR NON WORKER INJURY; COMPLAINTS FROM PUBLIC; PREVIOUS AGENCY ACTION)</u>:

Limited water quality data exists for Site 1. Water quality samples collected from six shallow monitoring wells at the site during previous Phase II investigations in April and September 1984

were analyzed for the parameters shown in Attachment 1. Sites 2 and 3 will be sampled for the first time during the upcoming investigation; consequently, no background data exists for these sites. Site 4, Grassy Pond Annex Supply Well 10, was analyzed for TOX, pH, conductivity, dissolved organic carbon, oil and grease, and primary drinking water metals during previous Phase II investigations. The sample yielded totally unremarkable results from this supply well.

WASTE TYPE(S)

Liquid__X__ Solid_____ Sludge_____ Gas_____

CHARACTERISTIC(S)

Corrosive_____ Ignitable__X__ Radioactive_____
Volatile_X__ Toxic_X__ Reactive____ Unknown_____

HAZARD EVALUATION

Overall Hazard

JP-4 is approximately 65 percent gasoline and 35 percent light petroleum distillate. Dissolved contaminants which may potentially be present include aliphatics (C_5-C_{16}), purgeable aromatics (benzene, toluene, ethylbenzene, and xylene) and polynuclear aromatic hydrocarbons (e.g., naphthalene).

JP-4 jet fuel has a flash point of -10 to 30°F, making it a dangerous fire hazard. Extreme caution must be observed that no sparks or spark sources are within 50 feet of the well during drilling or within 25 feet during sampling. Particular care should be paid to any electrical connections within the radius to determine that they are properly grounded. If unsafe conditions are observed or suspected, leave the immediate area until

corrective actions are taken and the potential fire hazard has been abated. The pump station has six 50,000-gallon JP-4 fuel storage tanks with associated underground piping.

Chemical Hazard

There is no TLV for JP-4 fuel, but for major constituents in gasoline, the TLV is 300 ppm. Gasoline is a skin irritant and possible allergen. Inhalation studies of gasoline pump workers find no effects to headache, fatigue, sleep disturbance, increased breathing rate, loss of memory, and blood changes. Many of the toxic effects of high level exposures may be attributable to lead in gasoline. Ingestion of gasoline can produce severe symptoms of poisoning. Do not induce vomiting if ingested! Kerosene is a component of JP-4 and NIOSH recommends an 8-hour TWA of 14 ppm, which is the air saturation concentration. The toxic effects are similar to gasoline. The odor threshold is 20 ppm. Jet fuel toxicity studies found one case in which a jet pilot became intoxicated owing to a fuel line leak. The cockpit concentration was calculated to be 3,000 to 7,000 ppm of JP-4. Long-term worker exposures to 500 to 3,000 ppm have produced dizziness, headache, nausea, palpitation and pressure in the chest. In summary, JP-4 exhibits a low chemical toxicity.

At the Southwest Landfill, trace amounts (<10 ppb) of chlorobenzene, 1,4-dichlorobenzene and benzene were detected in monitoring well samples collected previously (see Attachment 1). The 8-hour TWA for 1,4-dichlorobenzene and chlorobenzene are both listed as 75 ppm. Benzene is a suspected carcinoger with an 8-hour TWA of 10 ppm.

Physical Hazards

Heat and noise are the major physical hazards. The proximity to the runway will expose team members to high noise levels. Hearing

protectors must be worn to protect hearing when it is excessively loud. Exposure to extensive noise can cause short-term hearing loss and repeated noise exposures can lead to permanent hearing loss. The OSHA 8-hour TWA is 90 decibels, but NIOSH recommends 85 decibels, with a ceiling limit of 115 decibels. All team members should be acutely aware of the potential presence of poisonous snakes. Snake venom serum is available at the base hospital. All members should look closely where they are walking and move deliberately. Be alert to electrical storms. Drilling rigs should be shut down and vacated when lightning approaches within ½ mile of the site.

III. SITE SAFETY WORK PLAN

PERIMETER ESTABLISHMENT

Map/Sketch Attached Yes ; Perimeter Identified Yes; Zone(s) of Contamination Identified No

SITE PERSONNEL

Level of Protection:

A ______ B ______ C __X__ D __X__

Modifications: Steel toe, steel shank rubber or neoprane boots, long-sleeve shirts, long pants, cotton clothing, and safety glasses. Hard hats within 30 feet of drilling rig during active drilling operation. For well installation add Tyvek coveralls, neoprene gloves with surgical inner gloves. Tape boots and gloves to Tyveks. For water sampling or other splash potential work, wear Saranex coveralls instead of Tyvek. Have a full face APR with organic vapor cartridges available. Wear a face shield if there is splash potential. Mount hearing protection muffs on hard hat and wear muffs whenever noise level is loud enough to interfere with a shouted conversation at 6-inch distance. This level roughly corresponds to 85 decibels.

RECORD OF HAZARDOUS WASTE FIELD ACTIVITY

SITE NAME:
SITE SAFETY COORDINATOR:
PROJECT NUMBER:
RECORD OF ACTIVITIES FOR (DATES):

	Employee Name	Total Days Onsite	Days at the Site in				Number of days as SSC			Activities Employees Performed While Onsite
			Level B	Level C	Level D	or	Level B	Level C	Level D	
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										

Signiture of SSC: ______________________

Attachment 1

RESULTS OF ANALYSES OF ENVIRONMENTAL SAMPLES COLLECTED IN THE VICINITY OF THE SOUTHWEST LANDFILL, MOODY AFB, GEORGIA

APRIL AND SEPTEMBER 1984

Constituent (and units)	Well Locations					
	L-1	L-2	L-3	L-4	L-5	L-6
pH (S.U.) (April)	4.3	4.4	5.0	5.2	4.8	6.2
(September)	3.8	3.8	5.0	4.2	4.2	5.6
Specific conductance (April)	23	27	730	62	39	92
@ 25°C (umhos/cm) (September)	27	39	480	54	52	87
TOX (ug Cl/l) (April)	27	26	110	42	32	36
DOC (mg/l) (April)	<1.0	<1.0	<1.0	13.4	<1.0	<1.0
(September)	<0.5	<0.5	2.1	<0.5	<0.5	<0.5
COD (mg/l)	2.9	3.9	9.3	6.2	1.0	2.9
Oil and grease (mg/l) (April)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic (ug/l)	<2	<2	<2	<2	<2	<2
Barium (ug/l)	9	12	69	22	14	14
Cadmium (ug/l)	<6	<6	<6	<6	<6	<6
Chromium (ug/l)	<15	<15	<15	<15	<15	<15
Lead (ug/l)	<10	<10	<10	<10	<10	<10
Mercury (ug/l)	0.1	0.2	0.1	0.2	0.2	0.3
Selenium (ug/l)	<4	<4	<4	<4	<4	<4
Silver (ug/l)	<6	<6	<6	<6	<6	<6

Unless otherwised noted, samples collected in September 1984.

SOURCE: Installation Restoration Program Phase II, Water and Air Research, December 1985.

gnR301/024/1

Attachment 1 (Continued)
CONCENTRATIONS OF VOLATILE ORGANIC COMPOUNDS FOUND IN SAMPLES
COLLECTED AT THE SOUTHWEST LANDFILL, MOODY AFB, GEORGIA
SEPTEMBER 1984

Compound	Detection Limit*	Well Locations L-3	Well Locations L-6
METHOD 601			
Bromodichloromethane	1.0	BDL+	BDL
Bromoform	1.0	BDL	BDL
Bromomethane	1.0	BDL	BDL
Carbon tetrachloride	1.0	BDL	BDL
Chlorobenzene	1.0	9.2	BDL
Chloroethane	1.0	BDL	BDL
2-Chloroethylvinyl ether	1.0	BDL	BDL
Chloroform	1.0	BDL	BDL
Chloromethane	1.0	BDL	BDL
Dibromochloromethane	1.0	BDL	BDL
1,2-Dichlorobenzene	1.0	BDL	BDL
1,3-Dichlorobenzene	1.0	BDL	BDL
1,4-Dichlorobenzene	1.0	8.8	BDL
Dichlorodifluoromethane	1.0	BDL	BDL
1,1-Dichloroethane	1.0	BDL	BDL
1,2-Dichloroethane	0.1	BDL	BDL
Trans-1,2-Dichloroethane	1.0	BDL	BDL
1,2-Dichloropropane	1.0	BDL	BDL
Cis-1,3-Dichloropropene	1.0	BDL	BDL
Trans-1,3-Dichloropropene	1.0	BDL	BDL
Methylene chloride	1.0	BDL	BDL
1,1,2,2-Tetrachloroethane	1.0	BDL	BDL
Tetrachloroethene	1.0	BDL	BDL
1,1,1-Trichloroethane	1.0	BDL	BDL
1,1,2-Trichloroethane	1.0	BDL	BDL
Trichloroethene	1.0	2.1	BDL
Trichlorofluoromethane	1.0	BDL	BDL
Vinyl chloride	1.0	BDL	BDL
METHOD 602			
Benzene	0.5	3.7	BDL
Ethyl benzene	1.0	BDL	BDL
Toluene	1.0	BDL	BDL
Xylenes	1.0	BDL	BDL

*All values in ug/l.
+BDL = Below detection limit.

gnR301/024/2

Attachment 1 (Continued)
PESTICIDE AND HERBICIDE CONCENTRATIONS IN SAMPLES COLLECTED
AT THE SOUTHWEST LANDFILL, MOODY AFB, GEORGIA
SEPTEMBER 1984

Constituent (and units)	Detection Limit	Well Locations L-1	L-2	L-3	L-4	L-5	L-6
Heptachlor (ug/l)	0.005	BDL*	BDL	BDL	BDL	BDL	BDL
Heptachlor epoxide (ug/l)	0.005	BDL	BDL	BDL	BDL	BDL	BDL
Lindane (ug/l)	0.002	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodane (ug/l)	0.005	BDL	BDL	BDL	BDL	BDL	BDL
Toxaphene (ug/l)	0.01	BDL	BDL	BDL	BDL	BDL	BDL
Diazinon (ug/l)	0.005	BDL	BDL	BDL	BDL	BDL	BDL
Malathion (ug/l)	0.01	BDL	BDL	BDL	BDL	BDL	BDL
2,4-D (ug/l)	0.03	BDL	BDL	BDL	BDL	BDL	BDL
2,4,5-T (ug/l)	0.02	BDL	BDL	BDL	BDL	BDL	BDL
DDT-R (ug/l)+	0.03	BDL	BDL	BDL	BDL	BDL	BDL

*BDL = Below detection limit.
+(DDT-R represents the total of the following six isomers: o,p DDE; p,p DDE; o,p DDD; p,p DDD; o,p DDT; and p,p DDT. Detection limit (0.02 ug/l) is for each isomer.

Equipment and Materials: First aid kit, eye wash bottle, TLD badges, stretcher or blanket, drinking water and Gatorade or dilute fruit juice, paper cups, outdoor thermometer, mini-RAD.

Monitoring:

o Site 1

- HNU (10.2 eV lamp) or OVA/TIP: Record breathing zone levels continuously during work activities. Upgrade to Level C (organic vapor cartridges) at 1 ppm continuous readings above background in the breathing zone. Upgrade to Level B at 5 ppm continuous readings above background in the breathing zone.

- Explosimeter/O_2 Meter: Continuous during all drilling; observers should monitor their immediate surroundings.

  0-20% LEL - Proceed with caution

  Above 20% LEL - Evacuate upwind to a safe area, making sure to bring the HNU along. The HNU is not intrinsically safe and must not be used in an area where the LEL exceeds 20%. Alert the Moody AFB representative.

o Sites 2, 3, and 4

- HNU (10.2 eV lamp) or OVA/TIP: Record breathing zone levels every 30 minutes. At 5 ppm above background in breathing zone when source emissions have been detected, upgrade to Level C with organic vapor cartridges. At 10-25 ppm above background, monitor continuously and evacuate if levels persist between 10-25 ppm for more than 30 minutes. Do not resume work until levels drop

below 10 ppm above background. Above 25 ppm, evacuate. Be alert to humidity effects on lamp performance and clean lamp when needed.

- Explosimeter/O_2 Meter: Continuous during all drilling; observers should monitor their immediate surroundings.

  0-20% LEL - Proceed with caution

  Above 20% LEL - Evacuate upwind to a safe area, making sure to bring the HNU along. The HNU is not intrinsically safe and must not be used in an area where the LEL exceeds 20%. Alert the Moody AFB representative.

TEAM MEMBERS

Team Member	Responsibility
Well Point and Monitoring Well Installation:	
Brian Painter	Observation of Drilling Activities
Eric Meyer	Observation of Drilling Activities
Bill McElroy	Optional Field Observer During Drilling Activities
Sampling:	
Doug Nelson	Field Sampling
Bob Peterson	Field Sampling
Site Safety Coordinator	Tom Emenhiser

SITE ENTRY PROCEDURES

Sign in with base security and base representative and review base security procedures. Establish communications and emergency

procedures. Locate nearest available phone. Confirm emergency telephone numbers and hospital route. Secure a base permit prior to any drilling!

WORK LIMITATIONS (Time of day, etc.)

Daylight hours only. No eating, drinking, smoking, or chewing except in areas designated by SSC. Buddy system. No facial hair to interfere with respirator fit. No contact lenses. Initiate heat stress monitoring when ambient temperatures exceed 75°, including daily bodyweight changes, beverage breaks. Above 75°, schedule a drink break every 2 hours. Above 80°, schedule a drink break every 90 minutes, at a minimum. Try to provide a shaded work area and make sure rest area is shaded. DOD regulations require the use of seat belt during all travel on base.

DECONTAMINATION PROCEDURES

Personnel:

- For drink breaks: Remove hard hat, wash and remove outer gloves. Remove respirator. Partially unzip Tyvek coverall. Remove and discard inner gloves. Wash hands and face. Do not touch coveralls during break!!

- All other times: Standard Level C/D

Need: TSP, water, buckets, tubs, brushes, garbage bags, hand soap, paper towels

Equipment: Wrap monitoring equipment in plastic to reduce decon needs. Thoroughly wash all other equipment with TSP in water, rinse.

PLEASE NOTE: It is the responsibility of the Site Safety Coordinator to make sure all pieces of equipment coming offsite are properly decontaminated according to the procedures outlined above. Documentation of decontamination must be made in the field log notebook that will then become part of the permanent project file. The equipment number must be written in the field log notebook when the equipment comes offsite and is decontaminated with a denotation that proper procedures have been followed.

DISPOSAL OF MATERIALS GENERATED ON SITE

All disposables are the property and responsibility of Moody AFB. Package and label disposables according to instructions provided by base personnel.

IV. EMERGENCY INFORMATION:

All emergency phone numbers must be verified prior to site visit.

If an injury occurs onsite, take the following action:

* Get medical attention for the injured person immediately.

* Depending on the type and severity of the injury, notify Ray Harbison and/or the occupational physician for the injured person.

* Notify Mary Anne Chillingworth or Donna LaBar.

* Notify Sharon Robinson/CVO

* Write down all circumstances surrounding the incident which caused the injury, including, but not limited to, time of day, working conditions (weather, etc), how long it had been since the last rest period when the injury occurred, what the person

was doing when injured, what all other personnel onsite were doing, what level of protection was being used, if all safety procedures were being followed, etc. All team members that witnessed the incident should write down their recollection of the incident, give it to the site safety coordinator who shall then write up an exposure report. This exposure report needs to be sent to Sharon Robinson/CVO and Mary Anne Chillingworth/WDC (all REM jobs) or Donna LaBar/PDX.

LOCAL

For all emergencies, contact base facilities

Ambulance: 333-3232

USAF Hospital: 333-3232

Poison Control Center: 333-1110

Base Security: 333-3108

Fire: 333-3117

Base Utilities: Civil Engineering Service: 333-3678

EMERGENCY ROUTES AND HOSPITAL

All emergency routes must be verified prior to site visit.

EMERGENCY CONTACTS

1. Dr. Raymond Harbison, Ph.D. (University of Arkansas, Medical)
   Phone: 501-661-5766 or 661-5767
   501-370-8263 (24 hr)

2. Mary Anne Chillingworth/WDC, Health and Safety Director
   Phone: 703-620-5200 (O)
   703-476-0882 (H)

3. Donna J. LaBar/DEN, Assistant Health and Safety Director
   Phone: 303-771-0900 (O)
   303-693-0636 (H)

4. Occupational Physician
   Name: Dr. Robert Erickson
   Phone: 904-373-5600
   Address: 239 SW 7th Terrace, Suite C
   Gainesville, Florida 32601

   Team members under his care:

Doug Nelson	Bill McElroy
Brian Painter	Eric Meyer
Tom Emenhiser	

5. Project Manager
   Name: Roy Duke
   Phone: 904-377-2442

6. Client Contact
   Name: 2Lt. Gary Woodrum
   Phone: 512-536-2158

7. Moody AFB Contact
   Name: 2LT Lana Harvey
   Phone: 912-333-3505

8. Workmans Compensation Insurance
   Name: Mary Jo Jordan/GNV
   Phone: 904-377-2442

If an injury occurs onsite, please notify Mary Jo as soon as possible after obtaining medical attention for the injured. Notification must be made within 24 hours of the injury.

V. PLAN APPROVAL

PLAN PREPARED BY: Tom Emenhiser Date: October 2, 1986

APPROVED BY: Ray Duke Date: 10-10-86

Note to SSC: At the end of each week at the site, complete the attached "Record of Hazardous Waste Field Activity" and send it to:

Mary Anne Chillingworth
CH2M HILL
P.O. Box 4400
Reston, VA 22090

A copy of this record must be forwarded to the Project Manager, as well.

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GN21222.C0

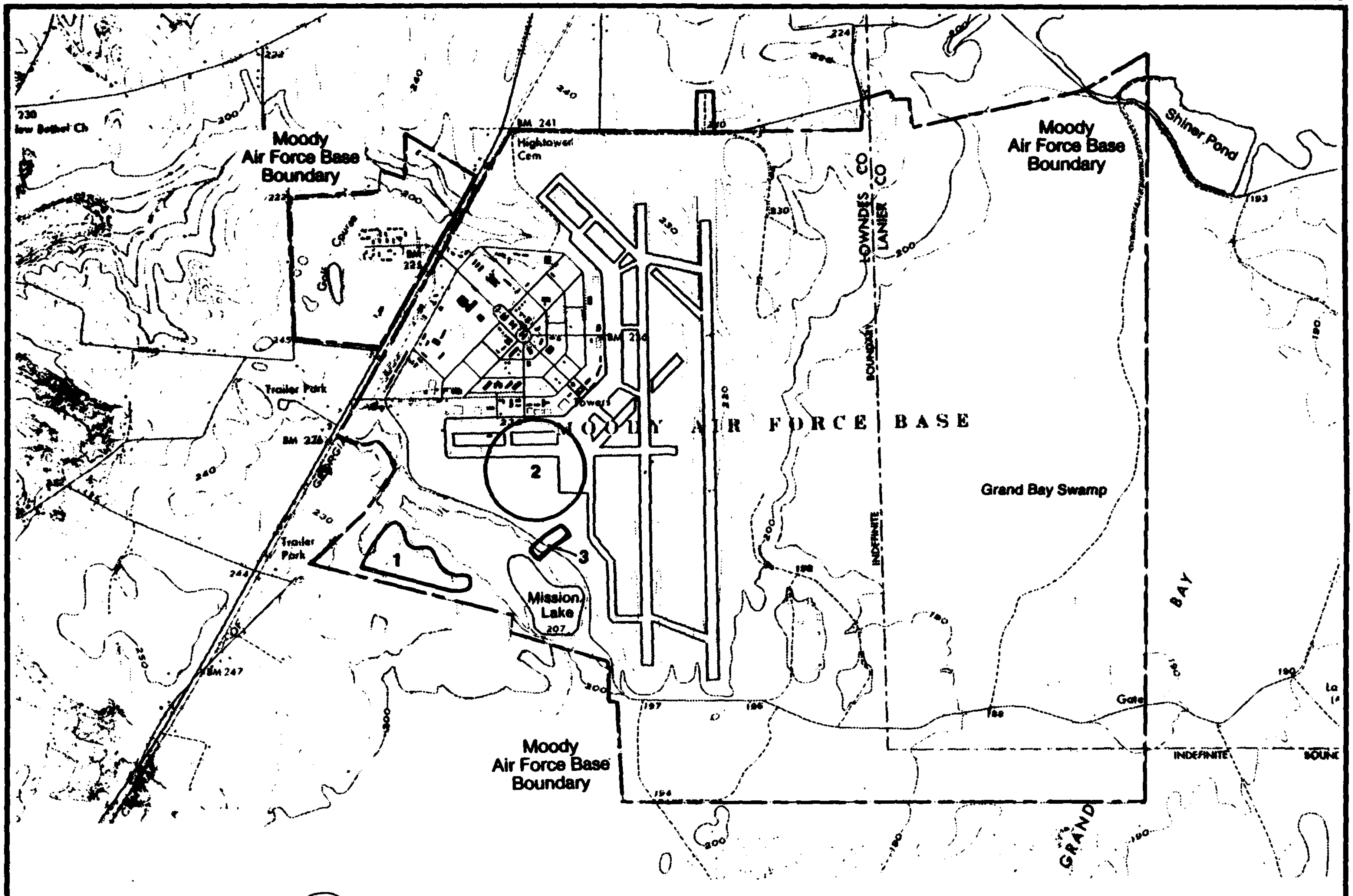

FIGURE 1.
Location Map for Additional Phase II Investigations, Sites 1—3.

CH2M HILL

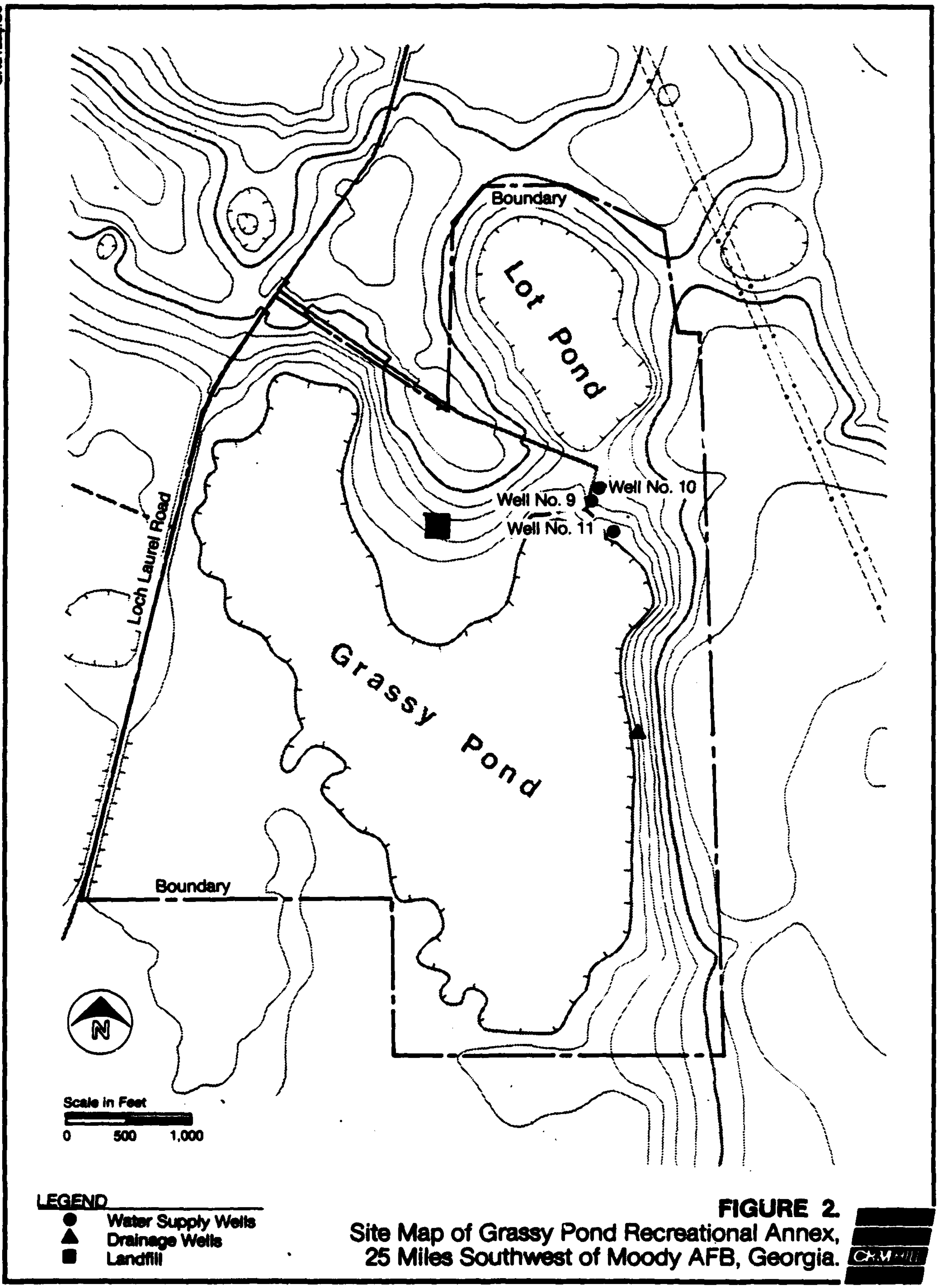

FIGURE 2.
Site Map of Grassy Pond Recreational Annex,
25 Miles Southwest of Moody AFB, Georgia.

Appendix F

INFORMAL TECHNICAL REPORT (INCLUDING PHASE II, STAGE 2 LABORATORY ANALYTICAL DATA, CHAIN OF CUSTODY FORMS, AND QA/QC DATA)

INSTALLATION RESTORATION PROGRAM
PHASE II--CONFIRMATION/QUANTIFICATION
STAGE 2

MOODY AIR FORCE BASE, GEORGIA 31601

30 January 1987

INFORMAL TECHNICAL REPORT

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION IS UNLIMITED

Prepared by

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Gainesville, Florida 32602

Prepared for

TACTICAL AIR COMMAND
COMMAND SURGEON'S OFFICE (HQ TAC/SGPB)
BIOENVIRONMENTAL ENGINEERING DIVISION
LANGLEY AIR FORCE BASE, VIRGINIA 23665

347th TACTICAL FIGHTER WING
MOODY AIR FORCE BASE, GEORGIA 31629

USAF OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (USAFOEHL)
TECHNICAL SERVICES DIVISION
BROOKS AIR FORCE BASE, TEXAS 78235-5501

INFORMAL TECHNICAL REPORT

This informal technical report presents the raw laboratory results of the analyses of water and soil samples collected at Moody Air Force Base, Georgia. These samples were collected in November and December, 1986, and analyzed in December, 1986.

Samples were collected from the following sites:

Site 1 - Southwest Landfill

Site 2 - Underground Waste Fuel Storage Area

Site 3 - Flightline Storm Drain Outfall Area

Moody AFB Water Supply Well No. 10 (Grassy Pond Annex)

Included in this report are tables summarizing the results at each of the above sites; the raw data laboratory analysis sheets; and, the chain of custody forms for the samples.

SUMMARY TABLES
WATER QUALITY ANALYSES

Table 1
PART I--WATER QUALITY SAMPLING SUMMARY--DECEMBER 1986[a]
SOUTHWEST LANDFILL (SITE 1)
MOODY AFB, GEORGIA

Date	Number	Type of Sample	Well Designation	Organics Σ 601[b]	Organics Σ 602[c]	Organics Σ 625[d]	PHs[e]
12-03-86	37804	Groundwater	L-1	BMDL[f]	BMDL	BMDL	7.5
12-04-86	37824	Groundwater	L-3	61	77	230[g]	<0.4
12-03-86	37805	Groundwater	L-7S	2	3	370[h]	<0.5
12-03-86	37806	Groundwater	L-8S	2	6	210[h]	<0.4
12-03-86	37807	Groundwater	L-9S	BMDL	BMDL	220[h]	<0.5
12-04-86	37825	Groundwater	L-10S	75	26	199[i]	10.9
12-03-86	37809	Groundwater	L-11S	1	BMDL	120[h]	18.8
12-04-86	37826	Groundwater	L-12S	2	BMDL	BMDL	11.1
12-04-86	37827	Groundwater	L-13D	3,600	<500	BMDL	11.9
12-04-86	37828	Groundwater	L-14D	6	BMDL	BMDL	10.5
12-03-86	37810	Groundwater	L-15D	21	530	26[j]	11.7
12-03-86	37752	Groundwater	WS-7	BMDL	BMDL	BMDL	31.2
12-03-86	37808	Duplicate (L-9S)	L-9D	BMDL	BMDL	97[h]	<0.3
12-03-86	37811	Travel Blank	--	1	BMDL	BMDL	11.6
12-04-86	37829	Bailer Blank	--	BMDL	BMDL	BMDL	<0.4
12-04-86	37830	Travel Blank	--	BMDL	BMDL	BMDL	9.0

[a] Locations and sampling parameters in accordance with 9-30-86 SOW. All samples collected by CH2M HILL pursuant to the SOW and analyzed according to the methods specified.
[b] Summation of halogenated volatile organics measured pursuant to EPA Method 601, expressed in parts per billion and rounded to the nearest integer.
[c] Summation of aromatic volatile organics measured pursuant to EPA Methods 602, expressed in parts per billion and rounded to the nearest integer.
[d] Summation of base neutral and acidic extractable priority pollutants measured pursuant to EPA Method 625, expressed in parts per billion and rounded to the nearest integer.
[e] Petroleum hydrocarbons measured pursuant to EPA Method 418.1, expressed in milligrams per liter.
[f] Below method detection limits
[g] Naphthalene (1.4), Diethyl phthalate (13), phenol (13), M/P cresol (150), substituted hexanoic acids (43), benzene acetic acid (10)
[h] Bis (2 ethylhexyl) phthalate
[i] 1,4 Dichlorobenzene (6.5), naphthalene (2.1), diethyl phthalate (17), bis (2 ethylhexyl) phthalate (160), phenol (2.8), M/P cresol (11)
[j] N,N-Dimethylacetamide

Table 2
PART II--WATER QUALITY SAMPLING SUMMARY--DECEMBER 1986[a]
SOUTHWEST LANDFILL (SITE 1)
MOODY AFB, GEORGIA

Date	Sample Number	Type of Sample	Well Designation	Priority Pollutant Metals Scan (ppb)[b] Sb	Be	Cd	Cr	Cu	Ni	Pb	Ag	Tl	Zn	Metals (mg/l)[c] As	Hg	Se	TDS (mg/l)[d]
12-03-86	37804	Groundwater	L-1	<50	<2.5	9	15	12	<13	<25	<2.5	<50	40	<.001	.0006	.009	70
12-04-86	37824	Groundwater	L-3	<50	7	9	170	<5	40	80	<2.5	<50	64	<.001	.0007	<.005	100
12-03-86	37805	Groundwater	L-7S	<50	<2.5	10	12	8	<13	<25	<2.5	<50	26	<.001	<.0002	.006	156
12-03-86	37806	Groundwater	L-8S	<50	<2.5	9	10	7	<13	<25	<2.5	<50	19	<.001	<.0002	<.002	58
12-03-86	37807	Groundwater	L-9S	<50	<2.5	9	<10	6	<13	<25	<2.5	<50	31	<.001	<.0002	<.002	54
12-0~~4~~5-86	37825	Groundwater	L-10S	<50	<2.5	<8	38	<5	<13	<25	<2.5	<50	19	.002	<.0002	<.005	156
12-03-86	37809	Groundwater	L-11S	<50	<2.5	11	11	10	<13	<25	<2.5	<50	12	<.001	.0002	<.005	22
12-04-86	37826	Groundwater	L-12S	<50	<2.5	<8	13	<5	<13	<25	<2.5	<50	18	.002	<.0002	<.005	104
12-0~~4~~5-86	37827	Groundwater	L-13D	<50	3.8	<8	13	6	<13	<25	<2.5	<50	73	<.001	.0003	.085	88
12-04-86	37828	Groundwater	L-14D	<50	6.3	11	18	31	55	<25	<2.5	<50	230	.018	.0006	<.005	204
12-03-86	37810	Groundwater	L-15D	<50	38	40	1,680	65	330	<25	15	<50	1,140	.029	.0017	<.005	7,400
12-0~~3~~1-86	37752	Groundwater	WS-7	<50	<2.5	<8	<10	<5	<13	<25	<2.5	<50	22	<.001	.0002	.005	198
12-03-86	37808	Duplicate (L-9S)	L-9D	<50	2.5	10	10	8	<13	<25	<2.5	<50	17	.020	.0002	<.002	~~--~~ 70
12-03-86	37811	Travel Blank	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12-04-86	37829	Bailer Blank	--	<50	<2.5	<8	21	9	<13	<25	<2.5	<50	240	<.001	<.0002	<.005	492
12-04-86	37830	Travel Blank	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[a]Locations and sampling parameters in accordance with 9-30-86 SOW. All samples collected by CH2M HILL pursuant to the SOW and analyzed according to the methods specified.
[b]Analyses pursuant EPA Method 200.7. Includes antimony, beryllium, cadmium, chromium, copper, nickel, lead, silver, thallium and zinc, respectively.
[c]Analyses pursuant to EPA Methods 206.2, 245.1, and 270.2 for arsenic, mercury, and selenium, respectively.
[d]Total dissolved solids measured as filterable residue pursuant to EPA Method 160.1.

gnR301A/029b

Table 3
WATER QUALITY SAMPLING SUMMARY--DECEMBER 1986[a]
UNDERGROUND WASTE FUEL STORAGE AREA (SITE 2)
MOODY AFB, GEORGIA

Date	Sample Number	Type of Sample	Sample Designation	602 Σ ~~601~~[b]	PHs[c]	Notes
12-03-86	37799	Groundwater	MU-1	14	1.2	
12-03-86	37800	Groundwater	MU-2	4,740	3.6	
12-03-86	37801	Groundwater	MU-3	2,600	1.0	
12-03-86	37802	Groundwater	MU-4	1,040	1.9	
12-03-86	37803	Groundwater	MU-5[d]	980	1.6	
11-24-86	37586	Soil	MU-2	410	262	Obtained during Standard Penetration Test from 2'-4' depth.
11-24-86	37587	Soil	MU-2	5,790	1,010	Obtained during Standard Penetration Test, from 4'-6' depth.
11-24-86	37588	Soil	MU-2	2,246	399	Obtained during Standard Penetration Test, from 6'-8' depth.
11-24-86	37589	Soil	MU-2	<100	438	Obtained during Standard Penetration Test, from 12'-14' depth.
11-24-86	37590	Duplicate (12'-14')	MU-2	<100	--	Duplicate of 12'-14' depth sample.

[a]Locations and sampling parameters in accordance with 9-30-86 SOW. All samples collected by CH2M HILL pursuant to the SOW and analyzed according to the methods specified.
[b]Summation of aromatic volatile organics measured pursuant to EPA Methods 602, expressed in parts per billion and rounded to the nearest integer.
[c]Petroleum hydrocarbons measured pursuant to EPA Method 418.1 (water) or EPA Method SW 3550 (soil). All values expressed in milligrams per liter (water) or milligrams per kilogram (soil).
[d]Duplicate sample of Well MU-4.

Table 4
WATER QUALITY SAMPLING SUMMARY--DECEMBER 1986[a]
FLIGHTLINE STORM DRAIN OUTFALL (SITE 3)
MOODY AFB, GEORGIA

Date	Sample Number	Type of Sample	Sample Location No.	Σ 601[b]	Σ 602[c]	PHs[d]	Pb[e]
12-01-86	37748	Water	1	BMDL	BMDL	<0.6	.008
12-01-86	37750	Sediment	1	<100	370	464	1.6
12-01-86	37749	Water	2	BMDL	BMDL	1.2	.005
12-01-86	37751	Sediment	2	<100	<100	12,800	10.9
12-01-86	37753	Travel Blank	--	1	BMDL	--	--
12-02-86	37762	Water	3	BMDL	BMDL	<0.6	.003
12-02-86	37763	Sediment	3	<100	<100	8,910	17.4
12-02-86	37764	Water	4	2	1	6.0	.008
12-02-86	37765	Sediment	4	<100	<100	8,000	215.0
12-02-86	37766	Water	5	2	BMDL	38.2	.010
12-02-86	37767	Sediment	5	<100	<100	8,030	21.6
12-02-86	37768	Sediment	6[f]	<100	<100	7,000	26.4
12-02-86	37769	Travel Blank	--	1	BMDL	--	--

[a]Locations and sampling parameters in accordance with 9-30-86 SOW. All samples collected by CH2M HILL pursuant to the SOW and analyzed according to the methods specified.
[b]Summation of halogenated volatile organics measured pursuant to EPA Method 601 (water) or EPA Methods SW 5030/8010 (sediment). All values expressed in parts per billion and rounded to the nearest integer.
[c]Summation of aromatic volatile organics measured pursuant to EPA Methods 602 (water) or EPA Methods SW 503/8020 (sediment). All values expressed in parts per billion and rounded to the nearest integer.
[d]Petroleum hydrocarbons measured pursuant to EPA Method 418.1 (water) or EPA Method SW 3550 (sediment). All values expressed in milligrams per liter (water), or milligrams per kilogram (soil).
[e]Lead measured pursuant to EPA Method 239.2 (water) or SW 3010/7420 (sediment). All values expressed in milligrams per liter (water) or milligrams per kilogram dry weight (soil).
[f]Duplicate sample of location number 5.

Table 5
PART I--WATER QUALITY SAMPLING SUMMARY--DECEMBER 1986[a]
WATER SUPPLY WELL NO. 10
GRASSY POND ANNEX, MOODY AFB, GEORGIA

Date	Sample Number	Type of Sample	Σ 601[b]	Σ 602[c]
12-04-86	37831	Groundwater	BMDL[d]	BMDL

[a]Sampling parameters in accordance with 9-30-86 SOW. All samples collected by CH2M HILL pursuant to the SOW and analyzed according to the methods specified.
[b]Summation of halogenated volatile organics measured pursuant to EPA Method 601, expressed in parts per billion and rounded to the nearest integer.
[c]Summation of aromatic volatile organics measured pursuant to EPA Methods 602, expressed in parts per billion and rounded to the nearest integer.
[d]Below method detection limits

LABORATORY ANALYTICAL REPORTS

CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Sample Nos. 37586-37590
Number of Samples: 5
Date Completed: 12/5/86
Date Reported: 1/21/87

REPORT OF ANALYSIS

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Project No. GN21222.C0
Received: 11/25/86

Description of Sample: Soil Samples
Collected on 11/24/86 by Brian Painter
Samples were preserved

PRIMARY ANALYTICAL COLUMN
SOIL SAMPLES

Purgeable Organic Analysis Method SW5030/SW 8020	#37586 MUS SPT 2'-4' DA:12/2/86 (µg/kg)	#37587 MUS SPT 4'-6' DA:12/2/86 (µg/kg)	#37588 MUS SPT 6'-8' DA:12/3/86 (µg/kg)	#37589 MUS SPT 12'-14' DA:12/2/86 (µg/kg)	#37590 MUS SPT 30'-32' DA:12/2/86 (µg/kg)
Tert-Butyl Methyl Ether	NA	NA	NA	NA	NA
Benzene	110	300[a]	36[b]	< 100	31[b]
Toluene	39[b]	290[a]	< 100	24[b]	< 100
Chlorobenzene	< 100	<1,000	< 100	< 100	< 100
Ethyl Benzene	< 100	<1,000	410	< 100	< 100
o-,m- and p-Xylene	300	5,200	1,800	< 100	< 100
1,3-Dichlorobenzene	< 100	<1,000	< 100	< 100	< 100
1,2-Dichlorobenzene	< 100	<1,000	< 100	< 100	< 100
1,4-Dichlorobenzene	< 100	<1,000	< 100	< 100	< 100

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
Soil samples analyzed on a wet weight basis.
NA = Not Analyzed
DA = Date Analyzed
[a] Presence indicated, but less than stated Method Detection Limit of 1,000 ppb (Dilution Factor: 1:1,000)
[b] Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

CONFIRMATION COLUMN
SOIL SAMPLES

Purgeable Organic Analysis Method SW5030/SW 8020	#37586 MUS SPT 2'-4' DA:12/3/86 (µg/kg)	#37587 MUS SPT 4'-6' DA:12/5/86 (µg/kg)	#37588 MUS SPT 6'-8' DA:12/3/86 (µg/kg)	#37589 MUS SPT 12'-14' DA:12/3/86 (µg/kg)	#37590 MUS SPT 30'-32' DA:12/3/86 (µg/kg)
Tert-Butyl Methyl Ether	< 100	< 100	< 100	< 100	< 100
Benzene	37[b]	46[b]	24[b]	32[b]	< 100
Toluene	< 100	280	130	43[b]	< 100
Chlorobenzene	< 100	< 100	< 100	46[b]	< 100
Ethyl Benzene	< 100	< 560	250	< 100	280
o-,m- and p-Xylene	150	2,800	1,100	< 100	< 100
1,3-Dichlorobenzene	< 100	< 100	< 100	120	< 100
1,2-Dichlorobenzene	< 100	< 100	< 100	< 100	< 100
1,4-Dichlorobenzene	< 100	< 100	< 100	< 100	< 100

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
Soil samples analyzed on a wet weight basis.
NA = Not Analyzed
DA = Date Analyzed
[a]Presence indicated, but less than stated Method Detection Limit of 1,000 ppb (Dilution Factor: 1:1,000)
[b]Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Thomas C. Erskine
Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Sample Nos. 37762-37769
Number of Samples: 8
Date Completed: 12/17/87
Date Reported: 1/21/87

REPORT OF ANALYSIS

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Project No. GN21222.C0
Received: 12/4/86

Description of Sample: Water and Soil Samples
Collected on 12/2/86 by Doug Nelson
Samples were preserved

PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37762 MFSW-3 DA: 12/10/86 (μg/l)	#37764 MFSW-4 DA: 12/10/86 (μg/l)	#37766 MFSW-5 DA: 12/10/86 (μg/l)	#37769 Travel Blank DA: 12/10/86 (μg/l)
Chloromethane	NA	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL	BMDL
Chloroethane	BMDL	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL	1.2
1,1,1-Trichloroethane	BMDL	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	1.9	2.0	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	BMDL	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL	BMDL
o-,m- and p-Xylene	1.0	1.1	1.1	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 μg/L
unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed

Respectfully submitted,

Thomas C. Ewbin

Laboratory Manager

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PRIMARY ANALYTICAL COLUMN
SOIL SAMPLES

Purgeable Organic Analysis Method SW5030/SW8010	#37763 MFSD-3 DA: 12/9/86 (µg/kg)	#37765 MFSD-4 DA: 12/9/86 (µg/kg)	#37767 MFSD-5 DA: 12/10/86 (µg/kg)	#37768 MFSD-6 DA: 12/10/86 (µg/kg)
Chloromethane	NA	NA	NA	NA
Bromomethane	< 100	< 100	< 100	< 100
Vinyl Chloride	< 100	< 100	< 100	< 100
Chloroethane	< 100	< 100	< 100	< 100
Dichloromethane	24*	27*	36*	30*
1,1-Dichloroethene	< 100	< 100	< 100	< 100
1,1-Dichloroethane	< 100	< 100	< 100	< 100
Trans-1,2-Dichloroethene	< 100	< 100	< 100	< 100
Chloroform	42*	43*	25*	30*
1,2-Dichloroethane	< 100	< 100	20*	18*
1,1,1-Trichloroethane	< 100	< 100	< 100	< 100
Carbon Tetrachloride	< 100	< 100	< 100	< 100
Dichlorobromomethane	< 100	< 100	< 100	< 100
1,2-Dichloropropane	< 100	< 100	< 100	< 100
Cis-1,3-Dichloropropene	< 100	< 100	< 100	< 100
Trichloroethene	< 100	< 100	< 100	< 100
Dibromochloromethane	< 100	< 100	< 100	< 100
1,1,2-Trichloroethane	< 100	< 100	< 100	< 100
Trans-1,3,-Dichloropropene	< 100	< 100	< 100	< 100
2-Chloroethylvinyl Ether	< 100	< 100	< 100	< 100
Bromoform	< 100	< 100	< 100	< 100
1,1,2,2-Tetrachloroethene	< 100	< 100	< 100	< 100
1,1,2,2-Tetrachloroethane	< 100	< 100	< 100	< 100
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	< 100	< 100	< 100	< 100
Toluene	14*	35*	16*	15*
Chlorobenzene	< 100	< 100	< 100	< 100
Ethyl Benzene	< 100	< 100	< 100	< 100
o-,m- and p-Xylene	< 100	730	< 100	< 100
1,3-Dichlorobenzene	< 100	< 100	< 100	< 100
1,2-Dichlorobenzene	< 100	< 100	< 100	< 100
1,4-Dichlorobenzene	< 100	< 100	< 100	< 100

NOTE: Method Detection Limit = 1 ppb unless specified otherwise
Soil Samples analyzed on a wet weight basis
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Thomas C. Ewkin

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

CONFIRMATION COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37762 MFSW-3 DA: 12/17/86 (μg/l)	#37766 MFSW-5 DA: 12/17/86 (μg/l)
Chloromethane	BMDL	BMDL
Bromomethane	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL
Chloroethane	BMDL	BMDL
Dichloromethane	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	1.8
Chloroform	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL
Cis-1,3-Dichloropropene and Trichloroethene	BMDL	1.4
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL
Bromoform	BMDL	BMDL
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	BMDL	2.4
Purgeable Organic Analysis Method SW5030/SW8020		
Tert-Butyl Methyl Ether	BMDL	BMDL
Benzene	BMDL	BMDL
Toluene	BMDL	BMDL
Chlorobenzene	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL

NOTE: Method Detection Limit = 1 μg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Thomas C. Erikson
Laboratory Manager

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gnR159/003/4

CONFIRMATION COLUMN
SOIL SAMPLES

Purgeable Organic Analysis Method SW5030/SW8010	#37763 MFSD-3 DA: 12/16/86 (µg/kg)	#37765 MFSD-4 DA: 12/16/86 (µg/kg)	#37767 MFSD-5 DA: 12/16/86 (µg/kg)	#37768 MFSD-6 DA: 12/16/86 (µg/kg)
Chloromethane	< 100	< 100	< 100	< 100
Bromomethane	< 100	< 100	< 100	< 100
Vinyl Chloride	< 100	< 100	< 100	< 100
Chloroethane	< 100	< 100	< 100	< 100
Dichloromethane	< 100	< 100	< 100	< 100
1,1-Dichloroethene	< 100	< 100	< 100	< 100
1,1-Dichloroethane	< 100	< 100	< 100	< 100
Trans-1,2-Dichloroethene	< 100	< 100	< 100	< 100
Chloroform	26*	< 100	31*	21*
1,2-Dichloroethane	< 100	< 100	< 100	< 100
1,1,1-Trichloroethane	40*	< 100	< 100	< 100
Carbon Tetrachloride	< 100	< 100	< 100	< 100
Dichlorobromomethane	< 100	< 100	< 100	< 100
1,2-Dichloropropane	< 100	< 100	< 100	< 100
Cis-1,3-Dichloropropene and Trichloroethene	< 100	< 100	< 100	< 100
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	< 100	< 100	< 100	< 100
2-Chloroethylvinyl Ether	< 100	< 100	< 100	< 100
Bromoform	< 100	< 100	< 100	< 100
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	< 100	< 100	< 100	< 100

Purgeable Organic Analysis Method SW5030/SW8020	#37763	#37765	#37767	#37768
Tert-Butyl Methyl Ether	< 100	< 100	< 100	< 100
Benzene	< 100	< 100	< 100	< 100
Toluene	< 100	< 100	< 100	< 100
Chlorobenzene	< 100	< 100	< 100	< 100
Ethyl Benzene	< 100	< 100	< 100	< 100
o-,m- and p-Xylene	< 100	< 100	67*	67*
1,3-Dichlorobenzene	< 100	< 100	< 100	< 100
1,2-Dichlorobenzene	< 100	< 100	< 100	< 100
1,4-Dichlorobenzene	< 100	< 100	< 100	< 100

NOTE: Method Detection Limit = 1 ppb unless specified otherwise
Soil samples analyzed on a wet weight basis
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Thomas C. Eardin

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/003/5

CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Sample Nos. 37748-37753
Number of Samples: 6
Date Completed: 12/16/87
Date Reported: 1/21/87

REPORT OF ANALYSIS

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Project No. GN21222.C0
Received: 12/3/86

Description of Sample: Water and Soil Samples
Collected on 12/1/86 by Doug Nelson
Samples were preserved

PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37748 MFSW-1 DA: 12/10/86 (µg/l)	#37749 MFSW-2 DA: 12/10/86 (µg/l)	#37752 MLSW-7 DA: 12/10/86 (µg/l)	#37753 Travel Blank DA: 12/10/86 (µg/l)
Chloromethane	NA	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL	BMDL
Chloroethane	BMDL	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL	1.3
1,1,1-Trichloroethane	BMDL	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	BMDL	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 µg/L
unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed

Respectfully submitted,

T. Lee E. Erwin

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

PRIMARY ANALYTICAL COLUMN
SOIL SAMPLES

Purgeable Organic Analysis Method SW5030/SW8010	#37750 MFSD-1 DA: 12/9/86 (µg/kg)	#37751 MFSD-2 DA: 12/9/86 (µg/kg)
Chloromethane	NA	NA
Bromomethane	< 100	< 100
Vinyl Chloride	< 100	< 100
Chloroethane	< 100	< 100
Dichloromethane	63*	61*
1,1-Dichloroethene	< 100	< 100
1,1-Dichloroethane	< 100	< 100
Trans-1,2-Dichloroethene	< 100	< 100
Chloroform	53*	25*
1,2-Dichloroethane	40*	< 100
1,1,1-Trichloroethane	< 100	< 100
Carbon Tetrachloride	37*	< 100
Dichlorobromomethane	< 100	< 100
1,2-Dichloropropane	< 100	< 100
Cis-1,3-Dichloropropene	< 100	< 100
Trichloroethene	32*	< 100
Dibromochloromethane	< 100	< 100
1,1,2-Trichloroethane	< 100	< 100
Trans-1,3,-Dichloropropene	< 100	< 100
2-Chloroethylvinyl Ether	< 100	< 100
Bromoform	< 100	< 100
1,1,2,2-Tetrachloroethene	42*	< 100
1,1,2,2-Tetrachloroethane	230	< 100
Purgeable Organic Analysis Method SW5030/SW8020		
Tert-Butyl Methyl Ether	NA	NA
Benzene	< 100	< 100
Toluene	81*	17*
Chlorobenzene	22*	< 100
Ethyl Benzene	510	190
o-,m- and p-Xylene	370	< 100
1,3-Dichlorobenzene	< 100	< 100
1,2-Dichlorobenzene	< 100	< 100
1,4-Dichlorobenzene	18*	< 100

NOTE: Method Detection Limit = 1 ppb unless specified otherwise
Soil samples analyzed on a wet weight basis.
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/002/3

CONFIRMATION COLUMN
SOIL SAMPLES

Purgeable Organic Analysis Method SW5030/SW8010	#37750 MFSD-1 DA: 12/16/86 (µg/kg)	#37751 MFSD-2 DA: 12/16/86 (µg/kg)
Chloromethane	< 100	< 100
Bromomethane	< 100	< 100
Vinyl Chloride	< 100	< 100
Chloroethane	< 100	< 100
Dichloromethane	< 100	< 100
1,1-Dichloroethene	< 100	< 100
1,1-Dichloroethane	< 100	< 100
Trans-1,2-Dichloroethene	< 100	< 100
Chloroform	25*	21*
1,2-Dichloroethane	< 100	< 100
1,1,1-Trichloroethane	< 100	< 100
Carbon Tetrachloride	< 100	< 100
Dichlorobromomethane	< 100	< 100
1,2-Dichloropropane	< 100	< 100
Cis-1,3-Dichloropropene and Trichloroethene	< 100	< 100
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	< 100	< 100
2-Chloroethylvinyl Ether	< 100	< 100
Bromoform	< 100	< 100
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	< 100	< 100

Purgeable Organic Analysis Method SW5030/SW8020	#37750 MFSD-1	#37751 MFSD-2
Tert-Butyl Methyl Ether	< 100	< 100
Benzene	< 100	< 100
Toluene	< 100	< 100
Chlorobenzene	< 100	< 100
Ethyl Benzene	< 100	< 100
o-,m- and p-Xylene	240	< 100
1,3-Dichlorobenzene	< 100	< 100
1,2-Dichlorobenzene	< 100	< 100
1,4-Dichlorobenzene	< 100	< 100

NOTE: Method Detection Limit = 1 ppb unless specified otherwise
Soil samples analyzed on a wet weight basis.
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

J. James P. Emerlin
Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/002/4

CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Sample Nos. 37799-37811
Number of Samples: 13
Date Completed: 12/17/87
Date Reported: 1/21/87

REPORT OF ANALYSIS

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Project No. GN21222.C0
Received: 12/5/86

Description of Sample: Water Samples
Collected on 12/3/86 by Robert Petersen
Samples were preserved

PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37799 MU-1 DA: 12/16/86 (ug/l)	#37800 MU-2 DA: 12/15/86 (ug/l)	#37801 MU-3 DA: 12/15/86 (ug/l)	#37802 MU-4 DA: 12/15/86 (ug/l)
Chloromethane	NA	NA	NA	NA
Bromomethane	BMDL	< 50	< 50	< 50
Vinyl Chloride	BMDL	< 50	< 50	< 50
Chloroethane	BMDL	< 50	< 50	< 50
Dichloromethane	BMDL	< 50	< 50	< 50
1,1-Dichloroethene	BMDL	< 50	< 50	< 50
1,1-Dichloroethane	BMDL	< 50	< 50	< 50
Trans-1,2-Dichloroethene	BMDL	< 50	< 50	< 50
Chloroform	1.5	49*	44*	48
1,2-Dichloroethane	BMDL	< 50	< 50	< 50
1,1,1-Trichloroethane	BMDL	< 50	< 50	< 50
Carbon Tetrachloride	BMDL	< 50	< 50	< 50
Dichlorobromomethane	BMDL	< 50	< 50	< 50
1,2-Dichloropropane	BMDL	< 50	< 50	< 50
Cis-1,3-Dichloropropene	BMDL	< 50	< 50	< 50
Trichloroethene	BMDL	< 50	< 50	< 50
Dibromochloromethane	BMDL	< 50	< 50	< 50
1,1,2-Trichloroethane	BMDL	< 50	< 50	< 50
Trans-1,3,-Dichloropropene	BMDL	< 50	< 50	< 50
2-Chloroethylvinyl Ether	BMDL	< 50	< 50	< 50
Bromoform	BMDL	< 50	< 50	< 50
1,1,2,2-Tetrachloroethene	BMDL	< 50	< 50	< 50
1,1,2,2-Tetrachloroethane	BMDL	< 50	< 50	< 50
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	1.6	2,400	2,200	600
Toluene	1.1	6.2*	7.1*	< 50
Chlorobenzene	BMDL	< 50	< 50	< 50
Ethyl Benzene	3.3	740	150	44*
o-,m- and p-Xylene	11	1,600	250	440
1,3-Dichlorobenzene	BMDL	< 50	< 50	< 50
1,2-Dichlorobenzene	BMDL	< 50	< 50	< 50
1,4-Dichlorobenzene	BMDL	< 50	< 50	< 50

NOTE: Method Detection Limit = 1 μg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
* Presence indicated but less than stated method detection limit of 50 ppb (dilution factor: 1:50)

Respectfully submitted,

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/004/2

PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37803 MU-5 DA: 12/15/86 (ug/l)	#37804 ML-1 DA: 12/16/86 (ug/l)	#37805 ML-7S DA: 12/16/86 (ug/l)	#37806 ML-8S DA: 12/16/86 (ug/l)	#37807 ML-9S DA: 12/16/86 (ug/l)
Chloromethane	NA	NA	NA	NA	NA
Bromomethane	< 50	BMDL	BMDL	BMDL	BMDL
Vinyl Chloride	< 50	BMDL	BMDL	BMDL	BMDL
Chloroethane	< 50	BMDL	BMDL	BMDL	BMDL
Dichloromethane	< 50	BMDL	1.8	1.9	BMDL
1,1-Dichloroethene	< 50	BMDL	BMDL	BMDL	BMDL
1,1-Dichloroethane	< 50	BMDL	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	< 50	BMDL	BMDL	BMDL	BMDL
Chloroform	45*	BMDL	BMDL	BMDL	BMDL
1,2-Dichloroethane	< 50	BMDL	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	< 50	BMDL	BMDL	BMDL	BMDL
Carbon Tetrachloride	< 50	BMDL	BMDL	BMDL	BMDL
Dichlorobromomethane	< 50	BMDL	BMDL	BMDL	BMDL
1,2-Dichloropropane	< 50	BMDL	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	< 50	BMDL	BMDL	BMDL	BMDL
Trichloroethene	< 50	BMDL	BMDL	BMDL	BMDL
Dibromochloromethane	< 50	BMDL	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	< 50	BMDL	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	< 50	BMDL	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	< 50	BMDL	BMDL	BMDL	BMDL
Bromoform	< 50	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	< 50	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	< 50	2.5	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020					
Tert-Butyl Methyl Ether	NA	NA	NA	NA	NA
Benzene	560	BMDL	BMDL	BMDL	BMDL
Toluene	< 50	BMDL	1.1	2.3	BMDL
Chlorobenzene	< 50	BMDL	BMDL	BMDL	BMDL
Ethyl Benzene	67	BMDL	1.5	1.4	BMDL
o-,m- and p-Xylene	420	BMDL	3.1	3.7	1.1
1,3-Dichlorobenzene	< 50	BMDL	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	< 50	BMDL	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	< 50	BMDL	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 µg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
* Presence indicated but less than stated method detection limit of 50 ppb (dilution factor: 1:50)

Respectfully submitted,

Thomas C. Eaken

Laboratory Manager

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PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37808 ML-9D DA: 12/16/86 (ug/l)	#37809 ML-11S DA: 12/16/86 (ug/l)	#37810 ML-15D DA: 12/16/86 (ug/l)	#37811 Travel Blank DA: 12/16/86 (ug/l)
Chloromethane	NA	NA	NA	NA
Bromomethane	BMDL	BMDL	< 50	BMDL
Vinyl Chloride	BMDL	BMDL	< 50	BMDL
Chloroethane	BMDL	BMDL	< 50	BMDL
Dichloromethane	BMDL	BMDL	31*	BMDL
1,1-Dichloroethene	BMDL	BMDL	< 50	BMDL
1,1-Dichloroethane	BMDL	BMDL	< 50	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	< 50	BMDL
Chloroform	BMDL	1.3	21*	BMDL
1,2-Dichloroethane	BMDL	BMDL	< 50	1.4
1,1,1-Trichloroethane	BMDL	BMDL	< 50	BMDL
Carbon Tetrachloride	BMDL	BMDL	< 50	BMDL
Dichlorobromomethane	BMDL	BMDL	< 50	BMDL
1,2-Dichloropropane	BMDL	BMDL	< 50	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	< 50	BMDL
Trichloroethene	BMDL	BMDL	< 50	BMDL
Dibromochloromethane	BMDL	BMDL	< 50	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	< 50	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	< 50	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	< 50	BMDL
Bromoform	BMDL	BMDL	< 50	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	< 50	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	< 50	BMDL
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	BMDL	BMDL	< 50	BMDL
Toluene	BMDL	BMDL	30*	BMDL
Chlorobenzene	BMDL	BMDL	< 50	BMDL
Ethyl Benzene	BMDL	BMDL	130	BMDL
o-,m- and p-Xylene	BMDL	BMDL	400	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	< 50	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	< 50	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	< 50	BMDL

NOTE: Method Detection Limit = 1 µg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 50 ppb (Dilution Factor: 1:50)

Respectfully submitted,

Thomas C. Emslie

Laboratory Manager

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CONFIRMATION COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37799 MU-1 DA: 12/17/86 (ug/l)	#37800 MU-2 DA: 12/16/86 (ug/l)	#37801 MU-3 DA: 12/16/86 (ug/l)	#37802 MU-4 DA: 12/16/86 (ug/l)
Chloromethane	BMDL	< 50	< 50	< 50
Bromomethane	BMDL	< 50	< 50	< 50
Vinyl Chloride	BMDL	< 50	< 50	< 50
Chloroethane	BMDL	< 50	< 50	< 50
Dichloromethane	BMDL	< 50	< 50	< 50
1,1-Dichloroethene	BMDL	< 50	< 50	< 50
1,1-Dichloroethane	BMDL	< 50	< 50	< 50
Trans-1,2-Dichloroethene	BMDL	< 50	< 50	< 50
Chloroform	BMDL	< 50	< 50	< 50
1,2-Dichloroethane	BMDL	< 50	< 50	< 50
1,1,1-Trichloroethane	BMDL	< 50	< 50	< 50
Carbon Tetrachloride	BMDL	< 50	< 50	< 50
Dichlorobromomethane	BMDL	< 50	< 50	< 50
1,2-Dichloropropane	BMDL	< 50	< 50	< 50
Cis-1,3-Dichloropropene and Trichloroethene	BMDL	< 50	< 50	< 50
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	< 50	< 50	< 50
2-Chloroethylvinyl Ether	BMDL	< 50	< 50	< 50
Bromoform	BMDL	< 50	< 50	< 50
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	BMDL	< 50	< 50	< 50
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	BMDL	26*	< 50	< 50
Benzene	BMDL	1,500	1,600	450
Toluene	BMDL	< 50	< 50	< 50
Chlorobenzene	BMDL	< 50	< 50	< 50
Ethyl Benzene	3.1	390	160	< 50
o-,m- and p-Xylene	8.8	1,200	300	430
1,3-Dichlorobenzene	BMDL	< 50	< 50	< 50
1,2-Dichlorobenzene	BMDL	< 50	< 50	< 50
1,4-Dichlorobenzene	BMDL	< 50	< 50	< 50

NOTE: Method Detection Limit = 1 µg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 100 ppb (Dilution Factor: 1:100)

Respectfully submitted,

Thomas E. Emerling
Laboratory Manager

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CONFIRMATION COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37803 MU-5 DA: 12/17/86 (ug/l)	#37804 ML-1 DA: 12/17/86 (ug/l)	#37805 ML-7S DA: 12/17/86 (ug/l)	#37806 ML-8S DA: 12/17/86 (ug/l)
Chloromethane	< 50	BMDL	BMDL	BMDL
Bromomethane	< 50	BMDL	BMDL	BMDL
Vinyl Chloride	< 50	BMDL	BMDL	BMDL
Chloroethane	< 50	BMDL	BMDL	BMDL
Dichloromethane	< 50	BMDL	1.5	1.5
1,1-Dichloroethene	< 50	BMDL	BMDL	BMDL
1,1-Dichloroethane	< 50	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	< 50	BMDL	BMDL	BMDL
Chloroform	< 50	BMDL	BMDL	BMDL
1,2-Dichloroethane	< 50	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	< 50	BMDL	BMDL	BMDL
Carbon Tetrachloride	< 50	BMDL	BMDL	BMDL
Dichlorobromomethane	< 50	BMDL	BMDL	BMDL
1,2-Dichloropropane	< 50	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene and Trichloroethene	< 50	BMDL	BMDL	1.5
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	< 50	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	< 50	BMDL	BMDL	BMDL
Bromoform	< 50	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	< 50	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	< 50	BMDL	BMDL	BMDL
Benzene	450	BMDL	BMDL	BMDL
Toluene	< 50	BMDL	BMDL	2.3
Chlorobenzene	< 50	BMDL	BMDL	BMDL
Ethyl Benzene	< 50	BMDL	BMDL	BMDL
o-,m- and p-Xylene	450	BMDL	2.6	3.7
1,3-Dichlorobenzene	< 50	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	< 50	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	< 50	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 µg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 50 ppb (Dilution Factor: 1:50)

Respectfully submitted,

Thomas E. Erskine
Laboratory Manager

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CONFIRMATION COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37807 ML-9S DA: 12/17/86 (ug/l)	#37810 ML-15D DA: 12/17/86 (ug/l)
Chloromethane	BMDL	< 50
Bromomethane	BMDL	< 50
Vinyl Chloride	BMDL	< 50
Chloroethane	BMDL	< 50
Dichloromethane	BMDL	< 50
1,1-Dichloroethene	BMDL	< 50
1,1-Dichloroethane	BMDL	< 50
Trans-1,2-Dichloroethene	BMDL	< 50
Chloroform	BMDL	9.4*
1,2-Dichloroethane	BMDL	< 50
1,1,1-Trichloroethane	BMDL	< 50
Carbon Tetrachloride	BMDL	< 50
Dichlorobromomethane	BMDL	< 50
1,2-Dichloropropane	BMDL	< 50
Cis-1,3-Dichloropropene and Trichloroethene	BMDL	< 50
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	< 50
2-Chloroethylvinyl Ether	BMDL	< 50
Bromoform	BMDL	< 50
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	BMDL	< 50
Purgeable Organic Analysis Method SW5030/SW8020		
Tert-Butyl Methyl Ether	BMDL	< 50
Benzene	BMDL	< 50
Toluene	BMDL	< 50
Chlorobenzene	BMDL	< 50
Ethyl Benzene	BMDL	72
o-,m- and p-Xylene	BMDL	250
1,3-Dichlorobenzene	BMDL	< 50
1,2-Dichlorobenzene	BMDL	< 50
1,4-Dichlorobenzene	BMDL	< 50

NOTE: Method Detection Limit = 1 µg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than stated Method Detection Limit of 50 ppb (Dilution Factor: 1:50)

Respectfully submitted,

Thomas C. Emlin

Laboratory Manager

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CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Sample Nos. 37824-37831
Number of Samples: 8
Date Completed: 12/17/87
Date Reported: 1/21/87

REPORT OF ANALYSIS

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Project No. GN21222.CO
Received: 12/5/86

Description of Sample: Water Samples
Collected on 12/4/86 by Robert Petersen
Samples were preserved

PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37824 ML-3 DA:12/17/86 (ug/l)	#37825 ML-10S DA:12/17/86 (ug/l)	#37826 ML-12S DA:12/17/86 (ug/l)	#37827 ML-13D DA:12/17/86 (ug/l)
Chloromethane	NA	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL	< 500
Vinyl Chloride	5.0	18	BMDL	< 500
Chloroethane	12	36	BMDL	< 500
Dichloromethane	34	23	2.3	3,600
1,1-Dichloroethene	BMDL	2.8	BMDL	< 500
1,1-Dichloroethane	4.8	11	BMDL	< 500
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL	< 500
Chloroform	BMDL	6.3	BMDL	< 500
1,2-Dichloroethane	1.7	11	BMDL	< 500
1,1,1-Trichloroethane	BMDL	BMDL	BMDL	< 500
Carbon Tetrachloride	BMDL	BMDL	BMDL	< 500
Dichlorobromomethane	BMDL	BMDL	BMDL	< 500
1,2-Dichloropropane	BMDL	BMDL	BMDL	< 500
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL	< 500
Trichloroethene	1.5	2.4	BMDL	< 500
Dibromochloromethane	BMDL	BMDL	BMDL	< 500
1,1,2-Trichloroethane	BMDL	BMDL	BMDL	< 500
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL	< 500
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL	< 500
Bromoform	BMDL	BMDL	BMDL	< 500
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL	< 500
1,1,2,2-Tetrachloroethane	BMDL	2.4	BMDL	< 500
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	1.5	2.1	BMDL	< 500
Toluene	61	11	BMDL	< 500
Chlorobenzene	BMDL	1.8	BMDL	< 500
Ethyl Benzene	3.4	1.8	BMDL	< 500
o-,m- and p-Xylene	11	5.4	BMDL	< 500
1,3-Dichlorobenzene	BMDL	BMDL	BMDL	< 500
1,2-Dichlorobenzene	BMDL	BMDL	BMDL	< 500
1,4-Dichlorobenzene	BMDL	4.1	BMDL	< 500

NOTE: Method Detection Limit = 1 μg/L
unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed

Respectfully submitted,

Thomas C. Erskine

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/005/2

PRIMARY ANALYTICAL COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37828 ML-14D DA:12/18/86 (ug/l)	#37829 Bailer Blank DA:12/18/86 (ug/l)	#37830 Travel Blank DA:12/18/86 (ug/l)	#37831 MGSW-10 DA:12/17/86 (ug/l)
Chloromethane	NA	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL	BMDL
Chloroethane	BMDL	BMDL	BMDL	BMDL
Dichloromethane	5.5	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020				
Tert-Butyl Methyl Ether	NA	NA	NA	NA
Benzene	BMDL	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 µg/L unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed

Respectfully submitted,

Thomas C. Erechin
Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/005/3

CONFIRMATION COLUMN
WATER SAMPLES

Purgeable Organic Analysis Method E601	#37824 ML-3 DA:12/17/86 (ug/l)	#37825 ML-10S DA:12/17/86 (ug/l)	#37827 ML-13D DA:12/17/86 (ug/l)
Chloromethane	BMDL	NA	< 500
Bromomethane	BMDL	BMDL	< 500
Vinyl Chloride	2.7	16	< 500
Chloroethane	1.0	BMDL	< 500
Dichloromethane	22	16	2,300
1,1-Dichloroethene	BMDL	1.3	< 500
1,1-Dichloroethane	3.4	9.8	< 500
Trans-1,2-Dichloroethene	7.2	6.8	< 500
Chloroform	BMDL	3.6	< 500
1,2-Dichloroethane	1.4	9.2	< 500
1,1,1-Trichloroethane	BMDL	BMDL	200*
Carbon Tetrachloride	BMDL	BMDL	< 500
Dichlorobromomethane	BMDL	BMDL	< 500
1,2-Dichloropropane	BMDL	BMDL	< 500
Cis-1,3-Dichloropropene and Trichloroethene	2.3	3.5	< 500
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	BMDL	< 500
2-Chloroethylvinyl Ether	BMDL	BMDL	< 500
Bromoform	BMDL	BMDL	< 500
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	BMDL	BMDL	< 500
Purgeable Organic Analysis Method SW5030/SW8020			
Tert-Butyl Methyl Ether	BMDL	BMDL	< 500
Benzene	1.5	1.5	< 500
Toluene	49	8.4	< 500
Chlorobenzene	BMDL	1.7	< 500
Ethyl Benzene	3.2	1.9	< 500
o-,m- and p-Xylene	11	5.9	< 500
1,3-Dichlorobenzene	BMDL	BMDL	< 500
1,2-Dichlorobenzene	BMDL	BMDL	< 500
1,4-Dichlorobenzene	1.8	3.3	< 500

NOTE: Method Detection Limit = 1 µg/L
unless specified otherwise
BMDL= Below Method Detection Limit
NA = Not Analyzed
DA = Date Analyzed
*Presence indicated, but less than
stated Method Detection Limit of
500 ppb (Dilution Factor: 1:500)

Respectfully submitted,

T. Karen E. Eneslin

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/005/4

CH2M HILL
Engineers
Planners
Economists
Scientists

December 11, 1986

MG156.35

Ms. Kathyrn Starcher
CH2M HILL, Inc.
P.O. Box 1647
Gainesville, Florida 32602

RE: Analytical Data For Laboratory No. 8438

Dear Ms. Starcher:

On December 4, 1986 the CH2M Hill Montgomery Laboratory received one water sample with a request for analysis of selected organic parameters.

The analytical results and the associated surrogate quality control data are enclosed. No unusual difficulties were encountered during the analysis of these samples.

If you should have any questions concerning the data, please call.

Sincerely,

Harold E. Cole

Harold E. Cole
Manager, Organic Analysis

Enclosures
cc: Craig Vinson

CH2M HILL

ORGANIC ANALYSIS

SAMPLE INFORMATION

Lab No: 8438

Client: Moody Air Force Base

Address: CH2M Hill, Inc., P.O. Box 1647, Gainesville, Florida 32602

Date Received: 12/4/86 Date Reported: 12/11/86

SAMPLE MATRICES: Water X Soil ____ Sludge ____ Other ____

ANALYSIS REQUESTED:

1. Priority Pollutants: Volatiles			2. SDWA Pesticides	
	Base/Neutrals	1	3. SDWA Herbicides	
	Acids	1	4. Trihalomethanes	
	Pesticides		5. Ethylene Dibromide	
	PCBs		6. Total Organic Halogen	

7. Other: ____

ANALYTICAL INSTRUMENTATION

X Finnigan Models 4021, 5100, 4510 Gas Chromatographs/Mass Spectrometer/Data Systems equipped with Tekmar's LSC-2, LSC-3, and the 4200 Automatic Heated Sampler Module.

____ Varian Models 3700 and 6000 Gas Chromatographs equipped with flame ionization, electron capture, thermionic specific, flame photometric detectors and autosamplers. State of the art Varian Vista 402 Data System and Hewlett Packard integrators.

____ Dohrman DX-20 Total Organic Halide System.

____ Waters High Pressure Liquid Chromatograph with UV and Fluorescence detectors.

ANALYTICAL METHODOLOGY

1. Priority Pollutants: The water samples are analyzed in accordance with procedures described in Methods 608, 624, and 625, EPA-600/4-82-057 (1982). The soil samples are analyzed in accordance with procedures described in Methods 8080, 8240, and 8270, Test Methods for Evaluating Solid Waste, 1982.

2. Phenoxyacid Herbicides: Samples are analyzed in accordance with procedures outlined in Method 7, Federal Register, Vol.38, No.75, Part II, November 28, 1973.

3. Total Organic Halides: Samples are analyzed in accordance with procedures outlined in Method 9020, USEPA, Test Methods for Evaluating Solid Waste, 1982, SW-846, Second Edition.

4. Trihalomethanes: Samples are analyzed in accordance with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

5. Ethylene dibromide: Water samples are analyzed in accordance with procedures outlined in Method 504, Federal Register (50 FR 46902), November 13, 1985.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8438-1
Date Received: 12/4/86
Date Extracted:12/8/86
Date Analyzed: 12/9/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - 12/3/86 #37752, MLSW-7, SITE 1

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc. 2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	57
2-Fluorobiphenyl	75
D10-Pyrene	101
D12-Terphenyl	90

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

A C I D   C O M P O U N D S
GC/MS REPORT

Laboratory No.: 8438-1
Date Received: 12/4/86
Date Extracted: 12/8/86
Date Analyzed: 12/9/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - 12/3/86, 37752, MLSW-7,SITE 1

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	48
d5-Phenol	28
2,4,6-Tribromophenol	58

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8438BLK
Date Received: NA
Date Extracted:12/8/86
Date Analyzed: 12/9/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - METHOD BLANK

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	64
2-Fluorobiphenyl	75
D10-Pyrene	95
D12-Terphenyl	86

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8438BLK
Date Received: NA
Date Extracted: 12/8/86
Date Analyzed: 12/9/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - METHOD BLANK

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	54
d5-Phenol	32
2,4,6-Tribromophenol	59

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M

Engineers
Planners
Economists
Scientists

December 22, 1986

MG156.35

Ms. Kathyrn Starcher
CH2M HILL, Inc.
P.O. Box 1647
Gainesville, Florida 32602

RE: Analytical Data For Laboratory No. 8456

Dear Ms. Starcher:

On December 9, 1986 the CH2M Hill Montgomery Laboratory received fifteen water samples with a request for analysis of selected organic parameters.

The analytical results and the associated surrogate quality control data are enclosed. No unusual difficulties were encountered during the analysis of these samples.

If you should have any questions concerning the data, please call.

Sincerely,

Harold E. Cole

Harold E. Cole
Manager, Organic Analysis

Enclosures
cc: Craig Vinson

CH2M HILL

ORGANIC ANALYSIS

SAMPLE INFORMATION

Lab No: 8456

Client: Moody Air Force Base

Address: CH2M Hill, Inc., P.O. Box 1647, Gainesville, Florida 32602

Date Received: 12/9/86 Date Reported: 12/22/86

SAMPLE MATRICES: Water X Soil ____ Sludge ____ Other ____

ANALYSIS REQUESTED:

1. Priority Pollutants:	Volatiles		2. SDWA Pesticides	
	Base/Neutrals	15	3. SDWA Herbicides	
	Acids	15	4. Trihalomethanes	
	Pesticides		5. Ethylene Dibromide	
	PCBs		6. Total Organic Halogen	

7. Other:

ANALYTICAL INSTRUMENTATION

X Finnigan Models 4021, 5100, 4510 Gas Chromatographs/Mass Spectrometer/Data Systems equipped with Tekmar's LSC-2, LSC-3, and the 4200 Automatic Heated Sampler Module.

____ Varian Models 3700 and 6000 Gas Chromatographs equipped with flame ionization, electron capture, thermionic specific, flame photometric detectors and autosamplers. State of the art Varian Vista 402 Data System and Hewlett Packard integrators.

____ Dohrman DX-20 Total Organic Halide System.

____ Waters High Pressure Liquid Chromatograph with UV and Fluorescence detectors.

ANALYTICAL METHODOLOGY

1. Priority Pollutants: The water samples are analyzed in accordance with procedures described in Methods 608, 624, and 625, EPA-600/4-82-057 (1982). The soil samples are analyzed in accordance with procedures described in Methods 8080, 8240, and 8270, Test Methods for Evaluating Solid Waste, 1982.

2. Phenoxyacid Herbicides: Samples are analyzed in accordance with procedures outlined in Method 7, Federal Register, Vol.38, No.75, Part II, November 28, 1973.

3. Total Organic Halides: Samples are analyzed in accordance with procedures outlined in Method 9020, USEPA, Test Methods for Evaluating Solid Waste, 1982, SW-846, Second Edition.

4. Trihalomethanes: Samples are analyzed in accordance with procedures described in Method 501.2, Federal Register, Vol. 44, No. 231, Part II, November 29, 1979.

5. Ethylene dibromide: Water samples are analyzed in accordance with procedures outlined in Method 504, Federal Register (50 FR 46902), November 13, 1985.

CH2M HILL

BASE/NEUTRAL COMPOUNDS
GC/MS REPORT

Laboratory No.:8456BLK
Date Received: NA
Date Extracted:12/9/86
Date Analyzed: 12/11/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - METHOD BLANK

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	71
2-Fluorobiphenyl	77
D10-Pyrene	91
D12-Terphenyl	84

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456BLK
Date Received: NA
Date Extracted: 12/9/86
Date Analyzed: 12/11/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - METHOD BLANK

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	65
d5-Phenol	43
2,4,6-Tribromophenol	57

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-1
Date Received: 12/9/86
Date Extracted:12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37810, ML-15D, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL	N,N-Dimethylacetamide		26
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	78
2-Fluorobiphenyl	87
D10-Pyrene	102
D12-Terphenyl	88

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-1
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37810, ML-15D, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	55
d5-Phenol	33
2,4,6-Tribromophenol	61

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.: 8456-2
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37804, ML-1, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc. 2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	76
2-Fluorobiphenyl	89
D10-Pyrene	76
D12-Terphenyl	71

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Mark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

A C I D   C O M P O U N D S
GC/MS REPORT

Laboratory No.: 8456-2
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37804, ML-1, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	51
d5-Phenol	31
2,4,6-Tribromophenol	68

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Branden
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE / NEUTRAL COMPOUNDS
GC/MS REPORT

Laboratory No.:8456-3
Date Received: 12/9/86
Date Extracted:12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37805, ML-7S, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3′-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	370
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	62
2-Fluorobiphenyl	76
D10-Pyrene	140
D12-Terphenyl	129

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Mark Blanden
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-3
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37805, ML-7S, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	40
d5-Phenol	26
2,4,6-Tribromophenol	64

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-4
Date Received: 12/9/86
Date Extracted:12/9/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37807, ML-9S, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc. 2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	220
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	62
2-Fluorobiphenyl	82
D10-Pyrene	69
D12-Terphenyl	61

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-4
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37807, ML-9S, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	57
d5-Phenol	36
2,4,6-Tribromophenol	67

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

[signature]
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

B A S E / N E U T R A L   C O M P O U N D S

GC/MS REPORT

Laboratory No.:8456-5
Date Received: 12/9/86
Date Extracted:12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37808, ML-9D, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	97
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	66
2-Fluorobiphenyl	75
D10-Pyrene	78
D12-Terphenyl	97

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-5
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37808, ML-9D, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	43
d5-Phenol	32
2,4,6-Tribromophenol	67

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

B A S E / N E U T R A L   C O M P O U N D S

GC/MS REPORT

Laboratory No.:8456-6
Date Received: 12/9/86
Date Extracted:12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37806, ML-8S, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	210
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	45
2-Fluorobiphenyl	74
D10-Pyrene	96
D12-Terphenyl	88

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-6
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37806, ML-8S, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	26
d5-Phenol	23
2,4,6-Tribromophenol	66

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Mark Blanden
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-7
Date Received: 12/9/86
Date Extracted:12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37811, TRAVEL BLANK, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	50
2-Fluorobiphenyl	69
D10-Pyrene	102
D12-Terphenyl	97

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-7
Date Received: 12/9/86
Date Extracted: 12/9/86
Date Analyzed: 12/12/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37811, TRAVEL BLANK, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	36
d5-Phenol	25
2,4,6-Tribromophenol	54

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE / NEUTRAL COMPOUNDS
GC/MS REPORT

Laboratory No.:8456-8
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37809, ML-11S, 12/3/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	120
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	66
2-Fluorobiphenyl	74
D10-Pyrene	71
D12-Terphenyl	64

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-8
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37809, ML-11S, 12/3/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	54
d5-Phenol	36
2,4,6-Tribromophenol	64

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-9
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37824, ML-3, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	1.4*	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	13			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	78
2-Fluorobiphenyl	81
D10-Pyrene	79
D12-Terphenyl	72

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-9
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37824, ML-3, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc. PPB
Phenol	10	13	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL	Substituted Hexanoic acids		43
2-4-Dimethylphenol	10	BMDL	Benzene Acetic acid		10
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	1.0*			
M/P-Cresol	10	150			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	52
d5-Phenol	44
2,4,6-Tribromophenol	62

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Beard
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456BLK
Date Received: NA
Date Extracted:12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - METHOD BLANK

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	60
2-Fluorobiphenyl	64
D10-Pyrene	74
D12-Terphenyl	68

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 84568LK
Date Received: NA
Date Extracted: 12/10/86
Date Analyzed: 12/15/86

Client: , MOODY AIR FORCE BASE

Sample Description: WATER - METHOD BLANK

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	45
d5-Phenol	27
2,4,6-Tribromophenol	54

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Bronda
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

B A S E / N E U T R A L   C O M P O U N D S

GC/MS REPORT

Laboratory No.:8456-10
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37826, ML-12S, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	55
2-Fluorobiphenyl	78
D10-Pyrene	74
D12-Terphenyl	64

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS

GC/MS REPORT

Laboratory No.: 8456-10
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37826, ML-12S, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	48
d5-Phenol	27
2,4,6-Tribromophenol	49

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-11
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37829, BAILER BLANKS, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	43
2-Fluorobiphenyl	65
D10-Pyrene	72
D12-Terphenyl	62

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon

REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-11
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37829, BAILER BLANK, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	38
d5-Phenol	21
2,4,6-Tribromophenol	47

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-12
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37828, ML-14D, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	50
2-Fluorobiphenyl	75
D10-Pyrene	77
D12-Terphenyl	61

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-12
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37828, ML-14D, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	32
d5-Phenol	18
2,4,6-Tribromophenol	52

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-13
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37830, TRIP BLANKS, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	50
2-Fluorobiphenyl	68
D10-Pyrene	68
D12-Terphenyl	60

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-13
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/15/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37830, TRIP BLANK, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	44
d5-Phenol	23
2,4,6-Tribromophenol	41

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE / NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-14
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37825, ML-10S, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	6.5*	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	160
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	2.1*	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocyclopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	17			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	69
2-Fluorobiphenyl	83
D10-Pyrene	103
D12-Terphenyl	92

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Blanden
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-14
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37825, ML-10S, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Phenol	10	2.8*	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	1.0*			
M/P-Cresol	10	11			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	59
d5-Phenol	51
2,4,6-Tribromophenol	90

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Branden
REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS REPORT

Laboratory No.:8456-15
Date Received: 12/9/86
Date Extracted:12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37827, ML-13D, 12/4/86

Compounds	MDL1 PPB	Conc. 2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Bis(2-chloroethyl)ether	10	BMDL	Fluoranthene	10	BMDL
1,3-Dichlorobenzene	10	BMDL	Pyrene	10	BMDL
1,4-Dichlorobenzene	10	BMDL	Benzidine	40	BMDL
1,2-Dichlorobenzene	10	BMDL	Butyl benzyl phthalate	10	BMDL
Bis(2-Chloroisopropyl)ether	10	BMDL	2,3,7,8-Tetrachlorodibenzo-p-dioxin	10	BMDL
Hexachloroethane	10	BMDL	Benzo (a) anthracene	10	BMDL
N-nitroso-di-n-propylamine	10	BMDL	Chrysene	10	BMDL
Nitrobenzene	10	BMDL	3,3'-Dichlorobenzidine	40	BMDL
Isophorone	10	BMDL	Bis (2-ethylhexyl) phthalate	10	BMDL
Bis(2-chloroethoxy)methane	10	BMDL	Di-n-octyl phthalate	10	BMDL
1,2,4-Trichlorobenzene	10	BMDL	Benzo (b) fluoranthene	10	BMDL
Naphthalene	10	BMDL	Benzo (k) fluoranthene	10	BMDL
Hexachlorobutadiene	10	BMDL	Benzo (a) pyrene	10	BMDL
Hexachlorocylopentadiene	10	BMDL	Indeno (1,2,3-cd) pyrene	10	BMDL
2-Chloronaphthalene	10	BMDL	Dibenzo (a,h) anthracene	10	BMDL
Acenaphthylene	10	BMDL	Benzo (g,h,i) perylene	10	BMDL
Dimethylphthalate	10	BMDL	N-nitrosodimethylamine	ND5	
2,6-Dinitrotoluene	10	BMDL	Bis (chloromethyl) ether	ND5	
Acenaphthene	10	BMDL			
2,4-Dinitrotoluene	10	BMDL	OTHER COMPOUNDS**		
Fluorene	10	BMDL			
4-Chlorophenyl phenyl ether	10	BMDL			
Diethyl phthalate	10	BMDL			
N-nitrosodiphenylamine 3	10	BMDL			
1,2-Diphenylhydrazine 4	10	BMDL			
4-Bromophenyl phenyl ether	10	BMDL			
Hexachlorobenzene	10	BMDL			
Phenanthrene	10	BMDL			
Anthracene	10	BMDL			
Dibutyl phthalate	10	BMDL			

SURROGATE RECOVERIES	% Rec.
D5-Nitrobenzene	63
2-Fluorobiphenyl	82
D10-Pyrene	78
D12-Terphenyl	68

1 MDL = Method Detection Limit
2 BMDL = Below Method Detection Limit
3 Detected as Diphenylamine
4 Detected as Azobenzene
5 ND = Not Determined

Clark Brandon
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

ACID COMPOUNDS
GC/MS REPORT

Laboratory No.: 8456-15
Date Received: 12/9/86
Date Extracted: 12/10/86
Date Analyzed: 12/18/86

Client: MOODY AIR FORCE BASE

Sample Description: WATER - #37827, ML-13D, 12/4/86

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Co P
Phenol	10	BMDL	OTHER COMPOUNDS**		
2-Chlorophenol	10	BMDL			
2-Nitrophenol	10	BMDL			
2-4-Dimethylphenol	10	BMDL			
2-4-Dichlorophenol	10	BMDL			
4-Chloro-3-methylphenol	10	BMDL			
2,4,6-Trichlorophenol	10	BMDL			
2,4-Dinitrophenol	50	BMDL			
4-Nitrophenol	10	BMDL			
2-Methyl-4,6-dinitrophenol	50	BMDL			
Pentachlorophenol	10	BMDL			
O-Cresol	10	BMDL			
M/P-Cresol	10	BMDL			

SURROGATE RECOVERIES	% Rec.
2-Fluorophenol	46
d5-Phenol	33
2,4,6-Tribromophenol	67

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit

Clark Bra

REVIEW

Comments: * Presence indicated, but less than method detection limit.
** Tentatively identified and quantitatively estimated.

TSI

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS — INDUSTRIAL CHEMISTS
OFFICE 2471 SWAN ST. — P.O. BOX 52329
LABORATORIES 103-107 STOCKTON STREET
JACKSONVILLE, FLORIDA 32201
(904) 353-5761

Laboratory No. 76353 January 15, 19 87

Sample of Water CORRECTED REPORT

Date Received 12/8/86

For CH2M Hill Southeast, Inc., 7201 N.W. 11th Place, Gainesville, Florida 32608
Attn: Mr. Don Hash

Marks:

CERTIFICATE OF ANALYSIS OR TESTS

		Petro Hydrocarbons by IR, mg/L
Sample 1.	#37799, MU-1, Site 2, 1030, 12/3/86, Doug Nelson	1.2
Sample 2.	#37800, MU-2, Site 2, 1045, 12/3/86, Doug Nelson	3.6
Sample 3.	#37801, MU-3, Site 2, 1055, 12/3/86, Doug Nelson	1.0
Sample 4.	#37802, MU-4, Site 2, 1115, 12/3/86, Doug Nelson	1.9
Sample 5.	#37803, MU-5, Site 2, 0900, 12/3/86, Doug Nelson	1.6
Sample 6.	#37804, ML-1, Site 2, 1400, 12/3/86, Doug Nelson	7.5
Sample 7.	#37805, ML7S, Site 1, 1400, 12/3/86, Doug Nelson	<0.5
Sample 8.	#37806, ML8S, Site 1, 1530 12/3/86, Doug Nelson	<0.4
Sample 9.	#37807, ML9S, Site 1, 1445, 12/3/86, Doug Nelson	<0.5
Sample 10.	#37808, ML9Deep, Site 1, 12/3/86, Doug Nelson	<0.3
Sample 11.	#37809, ML11S, Site 1, 1700, 12/3/86, Doug Nelson	18.8
Sample 12.	#37810, ML15D, Site 1, 0830, 12/3/86, Doug Nelson	11.7
Sample 13.	#37811, Blank, 12/3/86, Doug Nelson	11.6
Sample 14.	#37824, MLs, Site 1, 0930, 12/4/86, Doug Nelson	<0.4
Sample 15.	#37825, ML10S, Site 1, 12/5/86 Doug Nelson	10.9

Respectfully submitted,

TECHNICAL SERVICES, INC.
BY Harvey C. Gray, Jr.

LABORATORY I.D. NO. 82145

TECHNICAL SERVICES, INC.

TSI

ENVIRONMENTAL CONSULTANTS — INDUSTRIAL CHEMISTS
OFFICE 2471 SWAN ST. — P.O. BOX 52329
LABORATORIES 103-107 STOCKTON STREET
JACKSONVILLE, FLORIDA 32201
(904) 353-5761

Laboratory No. 76353

January 15, 1987

Sample of Water

CORRECTED REPORT

Date Received 12/8/86

For CH2M Hill Southeast, Inc., 7201 N.W. 11th Place, Gainesville, Florida 32608
Attn: Mr. Don Hash

Marks:

CERTIFICATE OF ANALYSIS OR TESTS

	Petro Hydrocarbons by IR, mg/L
Sample 16. #37826, ML12S, Site 1, 12/4/86, Doug Nelson	11.1
Sample 17. #37827, ML13D, Site 1, 12/5/86, Doug Nelson	11.9
Sample 18. #37828, ML14D, Site 1, 12/4/86, Doug Nelson	10.5
Sample 19. #37820, Bailor Blank, Site 1, 1100, 12/4/86	<0.4
Sample 20. #37830, Blank (trip), 12/4/86	9.0

Respectfully submitted,

TECHNICAL SERVICES, INC.

BY Harvey C. Gray, Jr.

TSI

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS — INDUSTRIAL CHEMISTS
OFFICE 2471 SWAN ST. — P.O. BOX 52329
LABORATORIES 103-107 STOCKTON STREET
JACKSONVILLE, FLORIDA 32201
(904) 353-5761

Laboratory No. 76235

January 15, 1987

Sample of Water

CORRECTED REPORT

Date Received 12/5/86

For CH2M Hill Southeast, Inc., 7201 N.W. 11th Place, Gainesville, Florida 32608
Attn: Mr. Don Hash

Marks:
Moody, AFB, by Doug Nelson

CERTIFICATE OF ANALYSIS OR TESTS

	Petroleum Hydrocarbons Oil & Grease by IR, mg/L
Sample 1. #37748, MFSW-1, Site 3, 1400, 12/1/86	<0.6
Sample 2. #37749, MFSW-2, Site 3, 1530, 12/1/86	1.2
Sample 3. #37752, MLSW-7, Site 1, 1500, 12/1/86	31.2
Sample 4. #37762, MFSW-3, Site 3, 0915 12/2/86	<0.6
Sample 5. #37764, MFSW-4, Site 3, 1000, 12/2/86	6.0
Sample 6. #37766, MFSW-5, Site 3, 1045 12/2/86	38.2

Method: EPA 418.1
Date/Time: 12/16/86-
Analyst: JK

Respectfully submitted,

TECHNICAL SERVICES, INC.

BY Harvey C. Gray, Jr.

LABORATORY I.D. NO. 82145

TSI

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS — INDUSTRIAL CHEMISTS
OFFICE 2471 SWAN ST. — P.O. BOX 52329
LABORATORIES 103-107 STOCKTON STREET
JACKSONVILLE, FLORIDA 32201
(904) 353-5761

Laboratory No. 76325

January 15, 19 87

CORRECTED REPORT

Sample of Soil

Date Received 12/5/86

For CH2M Hill Southeast, Inc., 7201 N.W. 11th Place, Gainesville, Florida 32608
Attn: Mr. Don Hash

Marks:

CERTIFICATE OF ANALYSIS OR TESTS

	Petroleum Hydrocarbons Oil & Grease by IR, mg/kg as received
Sample 7. #37750, MFSW-1, Site 3, 1400 12/1/86	464.0
Sample 8. #37751, MFSW-2, Site 3, 1530 12/1/86	12800
Sample 9. #37763, MFSD-3, Site 3, 0915, 12/2/86	8910
Sample10. #37765, MFSD-4, Site 3, 1000, 12/2/86	8000
Sample11. #37767, MFSD-5, Site 3, 1045, 12/2/86	8030
Sample12. #37768, MFSD-6, Site 3, 1045, 12/2/86	7000

Method: EPA 418.1
Date/Time: 12/11/86-0800
Analyst: JR, DW

Respectfully submitted,

TECHNICAL SERVICES, INC.

BY Harvey C. Gray, Jr.

LABORATORY I.D. NO. 82145

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS — INDUSTRIAL CHEMISTS
OFFICE 2471 SWAN ST. — P.O. BOX 52329
LABORATORIES 103-107 STOCKTON STREET
JACKSONVILLE, FLORIDA 32201
(904) 353-5761

Laboratory No. 76166 January 15, 19 87

Sample of Soil CORRECTED REPORT

Date Received 11/26/86

For CH2M Hill Southeast, Inc., 7201 N.W. 11th Place, Gainesville, Florida 32608
Attn: Mr. Don Hash

Marks: P.O.# GN 4776.35, Project No. GN 21222.CO

CERTIFICATE OF ANALYSIS OR TESTS

	Petroleum Hydrocarbons, by IR, mg/kg as received
Sample 1	262
Sample 2	1010
Sample 3	399
Sample 4	438

Method: EPA 418.1
Date/Time: 12/16/86-
Analyst: JK

	Moisture, %
Sample 1	11.19
Sample 2	14.87
Sample 3	15.08
Sample 4	15.97

Method: EPA 160.3
Date/Time: 12/29/86-1600
Analyst: JR

Respectfully submitted,

TECHNICAL SERVICES, INC.

BY Harvey C. Gray, Jr.

LABORATORY I.D. NO. 82145

CH2M HILL NORTHWEST INC.
2300 N.W. Walnut Blvd.
Corvallis, OR 97330
503/752-4271

Environmental Laboratory
Date: January 28, 1987
Project No.: GN21222.C0.05

Moody A.F.B.

Subject: Analysis of six soil and 19 water samples which were received December 17, 1986, and assigned reference numbers 4247-1 through 4247-25. Soil sample results are expressed as milligrams per kilogram; water samples are expressed as milligrams per liter.

Soil Samples:

Sample I.D.			Lead, Pb	
GNV No.:	CVO No.:	Sample Decription	As Rec'd.	Dry
37750	4247-3	MFSD-1	1.4	1.6
37751	4247-4	MFSD-2	9.2	10.9
37763	4247-7	MFSD-3	14.1	17.4
37765	4247-9	MFSD-4	182	215
37767	4247-11	MFSD-5	18.3	21.6
37768	4247-12	MFSD-6	22.5	26.4

Water Samples:

Sample I.D.						
GNV No.:	CVO No.:	Sample Decription	Lead, Pb	Selenium,* Se	Arsenic, As	Mercury, Hg
37748	4247-1	MFSW-1	0.008	---	---	---
37749	4247-2	MFSW-2	0.005	---	---	---
37752	4247-5	MFSW-7	---	0.005	<0.001	0.0002
37762	4247-6	MFSW-3	0.003	---	---	---
37762-D	4247-6	MFSW-3 DUP.	<0.001	---	---	---
37764	4247-8	MFSW-4	0.008	---	---	---
37766	4247-10	MFSW-5	0.010	---	---	---
37809	4247-13	ML-11S	---	<0.005	<0.001	0.0002
37804	4247-14	ML-1	---	0.009	<0.001	0.0006
37805	4247-15	ML-7S	---	0.006	<0.001	<0.0002
37806	4247-16	ML-8S	---	<0.002	<0.001	<0.0002
37807	4247-17	ML-9S	---	<0.002	<0.001	<0.0002
37808	4247-18	ML-9D	---	<0.002	0.020	0.0002
37810	4247-19	ML-15D	---	<0.005	0.029	0.0017
37824	4247-20	ML-3	---	<0.005	<0.001	0.0007
37825	4247-21	ML10S	---	<0.005	0.002	<0.0002
37826	4247-22	ML-12S	---	<0.005	0.002	<0.0002
37827	4247-23	ML-13D	---	0.085	<0.001	0.0003
37828	4247-24	ML-14D	---	<0.005	0.018	0.0006
37829	4247-25	Bailer Blks.	---	<0.005	<0.001	<0.0002

* Matrix interferences did not allow for lower detection limit on all samples.

< Indicates "less than".

CH2M HILL NORTHWEST INC.
2300 N.W. Walnut Blvd.
Corvallis, OR 97330

Environmental Laboratory
Date: January 9, 1987
Project No.: GN21222.C0.05

All tests are performed in accordance with current Environmental Protection Agency guidelines as published in the Federal Register. Samples will be retained for 30 days unless otherwise requested.

The information shown on this sheet is test data only and no interpretation is intended or implied.

Lawrence J. Jacoby

Lawrence J. Jacoby, Ph.D
Environmental Laboratory Manager

PC5/004

Engineers
Planners
Economists
Scientists

INORGANIC REPORT OF ANALYSIS

Page: 1
Date: 01/30/87

CH2M HILL/GNV
P. O. Box 1647
Gainesville, Florida 32602

Project Number: GNV21222.CO

ATTN: Tom Emenheiser

Laboratory Number: 08505

RE: Sample(s) received by CH2M HILL on 12/18/88.
Moody AFB

Analysis Description	37804	37805	37806	37807	37808	37809	37810
	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Antimony (ppb)	<50	<50	<50	<50	<50	<50	<50
Beryllium (ppb)	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Cadmium (ppb)	9	10	9	9	10	11	40
Chromium (ppb)	15	12	10	<10	10	11	6800
Cooper (ppb)	12	8	7	6	8	10	65
Nickel (ppb)	<13	<13	<13	<13	<13	<13	330
Lead (ppb)	<25	<25	<25	<25	<25	<25	<25
Silver (ppb)	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	15
Thallium (ppb)	<50	<50	<50	<50	<50	<50	<50
Zinc (ppb)	40	26	19	31	17	12	1140

mgLAB3/045

Engineers
Planners
Economists
Scientists

INORGANIC REPORT OF ANALYSIS

Page: 2
Date: 01/30/87

CH2M HILL/GNV
P. O. Box 1647
Gainesville, Florida 32602

Project Number: GNV21222.CO

ATTN: Tom Emenheiser

Laboratory Number: 08505

RE: Sample(s) received by CH2M HILL on 12/18/88.
Moody AFB

Analysis Description	37824	37825	37826	37827	37828	37829	37752
	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Antimony (ppb)	<50	<50	<50	<50	<50	<50	<50
Beryllium (ppb)	7	<2.5	<2.5	3.8	6.3	<2.5	<2.5
Cadmium (ppb)	9	<8	<8	<8	11	<8	<8
Chromium (ppb)	170	38	13	13	18	21	<10
Cooper (ppb)	<5	<5	<5	6	31	9	<5
Nickel (ppb)	40	<13	<13	<13	55	<13	<13
Lead (ppb)	80	<25	<25	<25	<25	<25	<25
Silver (ppb)	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Thallium (ppb)	<50	<50	<50	<50	<50	<50	<50
Zinc (ppb)	64	19	18	73	230	240	22

Analyses performed in accordance with methods approved by the USEPA.

NOTE: THIS IS A REVISED REPORT OF ANALYSIS. 03/21/88

Respectfully Submitted,

Bill Rhodes
Inorganic Laboratory Manager

mgLAB3/045

CH2M HILL

ENVIRONMENTAL LABORATORIES
7201 N.W. Eleventh Place
P.O. Drawer 1647
Gainesville, Florida 32602
904/377-2442

Sample No. 37799-37811

Lab ID No. 82112

REPORT OF ANALYSIS

Client Moody AFB — Project No. GN21222.CO

Attention Bill McElroy — Received 12/3-12/5/86

Address GNV — Reported 12-15-86

Description of Sample: Water
Collected by Doug Nelson
Bob Peterson
12/3-12/5/86

Sample No.	Description	Total Dissolved Solids 180°C(mg/L)
37804	ML-1	70
37805	ML-7S	156
37806	ML-8S	58
37807	ML-9S	54
37808	ML-9D	70
37809	ML-11S	22
37810	ML-15D	7400

Respectfully submitted,

Thomas C. Erskine

Chemist

The information shown on this sheet is test data only and no interpretation of the data is intended or implied.

FL 1008

CH2M HILL

ENVIRONMENTAL LABORATORIES
7201 N.W. Eleventh Place
P.O. Drawer 1647
Gainesville, Florida 32602
904/377-2442

Sample No. 37824-37831

Lab ID No. 82112

REPORT OF ANALYSIS

Client Moody AFB | Project No. GN21222.C0

Attention Bill McElroy | Received 12/3-12/5/86

Address GNV | Reported 12-15-86

Description of Sample: Water
Collected by Doug Nelson
Bob Peterson
12/3-12/5/86

Sample No.	Description	Total Dissolved Solids 180°C(mg/L)
37824	ML-3	100
37825	ML-10S	156
37826	ML-12S	104
37827	ML-13D	88
37828	ML-14D	204
37829	Bailer Blank	492
37830	Travel Blank	--
37831	M6SW-10	--

Respectfully submitted,

Thomas C. Emslie [signature]

Chemist

Sample No. 37748-37753

Lab ID No. 82112

CH2M HILL

ENVIRONMENTAL LABORATORIES
7201 N.W. Eleventh Place
P.O. Drawer 1647
Gainesville, Florida 32602
904/377-2442

REPORT OF ANALYSIS

Client: Moody AFB — Project No. GN21222.CO

Attention: Bill McElroy — Received: 12/3-12/5/86

Address: GNV — Reported: 12-15-86

Description of Sample: Water
Collected by Doug Nelson
Bob Peterson
12/3-12/5/86

Sample No.	Description	Total Dissolved Solids 180°C(mg/L)
37752	MLSW-7	198

Respectfully submitted,

Thomas C. Erskine

Chemist

The information shown on this sheet is test data only and no interpretation of the data is intended or implied.

FL 1008

CHAIN-OF-CUSTODY FORMS

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: GN21222.C0

PROJECT NAME: MOODY AFB PHASE II

LABORATORY:

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PETROLEUM HYDROCARBONS	EPA 602							REMARKS
SITE 2	11-24			X	MUS SPT 2'-4' (SOILS)	2	✓	✓					375-86		
"	11-24			X	MUS SPT 4'-6' (SOILS)	2	✓	✓					87		
"	11-24			X	MUS SPT 6'-8' (SOILS)	2	✓	✓					88		
"	11-24			X	MUS SPT 12'-14' (SOILS)	2	✓	✓					89		
"	11-24			X	MUS SPT 30'-32' (SOILS)	1		✓					90		

SAMPLED BY AND TITLE (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Brian Painter / Hydrogeologist	11-24-86 3:00	Brian Painter	11-24 5:45	Bill McElroy 11-24-86
RELINQUISHED BY: (SIGNATURE)	**DATE/TIME**	**RECEIVED BY: (SIGNATURE)** / **RELINQUISHED BY: (SIGNATURE)**	**DATE/TIME**	**RECEIVED BY LAB: (SIGNATURE)**
			11/25 11:58	Cody Pugh

REMARKS ____________________

SAMPLE SHIPPED VIA ☐ UPS ☐ BUS ☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

DISTRIBUTION: WHITE — ORIGINAL ACCOMPANIES SHIPMENT, PINK — COPY TO COORDINATOR FIELD FILES, YELLOW — CLIENT

FORM 260

CHAIN OF CUSTODY RECORD

PROJECT NUMBER	PROJECT NAME
GN21122.4	Moody AFB-SITE 3

LABORATORY: GNV.

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	Halogenated VOA	Aromatic VOA	Petroleum Hydrocarbon	Lead		REMARKS
	12/2	9:15		✓	MFSW-3	4	1	1	1	1	37762	
		9:15		✓	MFSWX-3	4	1	1	1	1		Note:
		9:15		✓	MFSD-3	3 (4)	1	1	1	1	37763	ALL "X" Samples
		9:15		✓	MFSDX-3	3	1	1	1	1		are splits; delivered
												to MAFB BIO-ENV.
		10:00		✓	MFSW-4	4	1	1	1	1	37764	LAB FOR INDEPENDENT
		10:00		✓	MFSWX-4	4	1	1	1	1		AF OEHL ANALYSIS
		10:00		✓	MFSD-4	3	1	1	1	1	37765	
		10:00		✓	MFSDX-4	3	1	1	1	1		
		10:45		✓	MFSW-5	4	1	1	1	1	37766	
		10:45		✓	MFSWX-5	4	1	1	1	1		
		10:45		✓	MFSD-5	3	1	1	1	1	37767	
		10:45		✓	MFSDX-5	3	1	1	1	1		
		10:45		✓	MFSD-6	3	1	1	1	1	37768	
	12/2				Travel Blank	2	1	1			37769	
					total	26						

SAMPLED BY AND TITLE: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Robert J. Velema ET-3	12/2			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY LAB: (SIGNATURE)
Doug Nelson	12.3.86 0700			12/4/86 PM	[illegible]

REMARKS

SAMPLE SHIPPED VIA ☐ UPS ☐ BUS ☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

DISTRIBUTION: WHITE — ORIGINAL ACCOMPANIES SHIPMENT, PINK — COPY TO COORDINATOR FIELD FILES, YELLOW — CLIENT

FORM 340

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: GV21222 CO

PROJECT NAME:

LABORATORY: GNV

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	Halogenated Volatile Org	Aromatic Volatile Org	Petroleum Hydrocarbons	Lead	Ext Pri. Poll.	Pri. Poll. Metals	Selenium	Arsenic	Mercury	TDS	REMARKS
[illegible]SW-1	12.1.86	1400			Flight Line Storm	4	1	1	1	1			37	7	48		Splits taken at
					Drain Outfall Water												each location and
[illegible]SW-2	121	1530			"	4	1	1	1	1					49		given to AFB
																	marked w/ an "X"
~~[illegible]~~		~~1500~~															as nomenclature describes
(W) labeled as																	
[illegible]SD-1	121	1400			Flight Line Storm Drain	34	1	1	1	1					50		• See attached sheet
(W) labeled					Outfall Soil												for methods
[illegible]SD-2	121	1530			"	34	1	1	1	1					51		
[illegible]SW-7	121	1500			Supply Well No. 7	6	1	1	1		1	1	1	1	1	1	52
					VOA Travel Blank	2	1	1					3	7	7		53

SAMPLED BY AND TITLE (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Doug Nelson Eng Tech	12.1.86 1700			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY LAB: (SIGNATURE)
Doug Nelson	12.1.86 1700			12/2/86 [illegible]	[illegible]

REMARKS:

SAMPLE SHIPPED VIA ☐ UPS ☐ BUS ☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

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FORM 340

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: GN21222.co
PROJECT NAME: Moody AFB
LABORATORY: GNU

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	Halogenated VOA	Aromatic VOA	Ext. Priority Poll.	Petro Hydrocarbons	Prior. Poll. Metals	Selenium	Arsenic	~~[illegible]~~	Mercury	Filt. Residue	REMARKS
	12/3	0830		✓	ML-15D 37810	6	1	1	1	1	1					1	SHEET 1 OF 2
				✓	MLX-15D	9	1	1	1	1	1	1	1		1	1	
																	NOTE:
		0900		✓	ML-1 37804	6	1	1	1	1	1					1	ALL "X" SAMPLES
		0900		✓	MLX-1	9	1	1	1	1	1	1	1	●	1	1	DELIVERED TO AF FOR
																	QA/QC runs at
		1400		✓	ML-7S 37805	6	1	1	1	1	1					1	OEHL/TEXAS LAB
		1400		✓	MLX-7S	9	1	1	1	1	1	1	1		1	1	
																	MLX-1 HALOGENATED VOA
		1445		✓	ML-9S 37807	6	1	1	1	1	1					1	BROKEN IN PACKING
		1445		✓	MLX-9S	9	1	1	1	1	1	1	1		1	1	
		1445		✓	ML-9D 37808	6	1	1	1	1	1					1	
		1530		✓	ML-8S 37806	6	1	1	1	1	1					1	
		1530		✓	MLX-8S	9	1	1	1	1	1	1	1		1	1	
	↓				TRAVEL BLANK 37811	4	1	1	1	1							

3 COOLERS

SAMPLED BY AND TITLE: (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Robert J. Petersen ET-3	12/3 1750	Robert J. Petersen	12/4 825	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY LAB: (SIGNATURE)
				1/9/88 AM	[signature]

REMARKS

SAMPLE SHIPPED VIA ☐ UPS ☐ BUS ☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

DISTRIBUTION: WHITE — ORIGINAL ACCOMPANIES SHIPMENT, PINK — COPY TO COORDINATOR FIELD FILES, YELLOW — CLIENT

FORM 340

CHAIN OF CUSTODY RECORD

PROJECT NUMBER	PROJECT NAME
GN 21222.C0	Moody AFB

LABORATORY: GNV.

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	Halogenated VOA	Aromatic VOA	Ext. Priority Poll.	Petro. Hydro Carbons	Prior. Poll. Metals	Selenium	Arsenic	Mercury	Filt. Residue	REMARKS
	12/3	1700		✓	ML-11S 37809	6	1	1	1	1	1				1	Sheet 2 of 2
		1700		✓	MLX-11S	9	1	1	1	1	1	1	1	1	1	
																Note:
		1030		✓	MU-1	3	1	1		1		37799				All "X" samples
		1030		✓	MUX-1	3	1	1		1						delivered to AF
																for QA/QC
		1045		✓	MU-2	3	1	1		1		37800				
		1045		✓	MUX-2	3	1	1		1						
		1055		✓	MU-3	3	1	1		1		37801				
		1055		✓	MUX-3	3	1	1		1						
		1115		✓	MU-4	3	1	1		1		37802				
		1115		✓	MUX-4	3	1	1		1						
		1115		✓	MU-5	3	1	1		1		37803				

3 COOLERS

SAMPLED BY AND TITLE (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Robert J. Petersen ET-3	12/3/1750	Robert J. Petersen	12/4/0825	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY LAB: (SIGNATURE)
				12/5/[illegible] AM	[illegible signature]

REMARKS

SAMPLE SHIPPED VIA ☐ UPS ☐ BUS ☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

DISTRIBUTION: WHITE — ORIGINAL ACCOMPANIES SHIPMENT, PINK — COPY TO COORDINATOR FIELD FILES, YELLOW — CLIENT

FORM 340

[redacted] **CHAIN OF CUSTODY RECORD**

PROJECT NUMBER	PROJECT NAME
GN21222.C0	Moody AFB
LABORATORY	
GNU	

STA. NO.	DATE	TIME	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	Halogenated VOA	Aromatic VOA	Ext. Priority Pollutants	Petro Hydro Carbons	Prio. Poll. Metals	Arsenic	Selenium	Mercury	TDS		REMARKS
	12/4	9:30		✓	ML-3 37824	6	1	1	1	1	1				1		
	〃	9:30		✓	MLX-3	9	1	1	1	1	1	1	1	1	1		Note:
																	All "X" Samples Are
	12/4	10:30		✓	ML-12S 37826	6	1	1	1	1	1				1		Splits Delivered to
	〃	10:30		✓	MLX-12S	9	1	1	1	1	1	1	1	1	1		AF for QA/QC. Will
																	Be Shipped on 12/8
	12/4	11:00		✓	Bailer Blanks 37829	6	1	1	1	1	1				1		
	12/4	14:35		✓	ML-14D 37828	6	1	1	1	1	1				1		
	〃	14:35		✓	MLX-14D	9	1	1	1	1	1	1	1	1	1		
	12/4	16:45			MGSW-10 37831	2	1	1									Grassy Pond Annex Supply Well
	12/4			✓	Trip Blanks 37830	4	1	1	1	1							
	12/4	16:45			MGSWX-10	2	1	1									〃 〃 〃 〃 〃
	12/5	0830		✓	ML-10S 37825	6	1	1	1	1	1				1		
	12/5	0830		✓	MLX-10S	9	1	1	1	1	1	1	1	1	1		
	12/5	1030		✓	ML-13D 3782[illegible]7	6	1	1	1	1	1				1		
	12/5	1030		✓	MLX-13D	8	1	1	1	–	1	1	1	1	1		Petro Hydro. Bottle Broken

SAMPLED BY AND TITLE (SIGNATURE)	DATE/TIME	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Robert J. Petersen ET-3	16:33 12/4	Robert J. Petersen		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY LAB: (SIGNATURE)
				12/4/81 PM	Don [illegible]

REMARKS ______

SAMPLE SHIPPED VIA ☐ UPS ☐ BUS ☐ FEDERAL EXPRESS

AIR BUS BILL NUMBER

DISTRIBUTION. WHITE — ORIGINAL ACCOMPANIES SHIPMENT, PINK — COPY TO COORDINATOR FIELD FILES, YELLOW — CLIENT

FORM 340

LABORATORY QA/QC DATA

I. Blanks

A. Primary/Analytical Column

B. Confirmation Column

II. Standard Response Factors

A. Primary/Analytical Column

B. Confirmation Column

III. EPA Quality Control Results

A. Primary/Analytical Column

B. Confirmation Column

C. Combined Results

IV. Quality Assurance - Matrix Spikes/Duplicates

A. Primary/Analytical COlumn

B. Confirmation Column

V. Chromatographic Conditions

gnR159B/29

BLANKS -

PRIMARY/ANALYTICAL COLUMN

CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Number of Samples: 15
Date Reported: 1/20/87

REPORT OF ANALYSIS

Project No. FC21222.C0

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Description of Sample: Organic-Free Water Analysis
Analytical/Primary Column

Purgeable Organic Analysis Method E601	OFW Blank 1 + 50 µl MeOH 12/2/86 (ppb)	OFW Blank 2 12/2/86 (ppb)	OFW Blank 3 12/2/86 (ppb)
Chloromethane	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Chloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
OFW = Organic-Free Water

Respectfully submitted,

Thomas C. Emerlin

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/91/1

Purgeable Organic Analysis Method SW5030/SW8020	OFW Blank 1 + 50 µl MeOH 12/2/86 (ppb)	OFW Blank 2 12/2/86 (ppb)	OFW Blank 3 12/2/86 (ppb)
Tert-Butyl Methyl Ether	NA	NA	NA
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	3.5	2.5	BMDL
o-,m- and p-Xylene	4.3	3.6	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
OFW = Organic-Free Water

Respectfully submitted,

Thomas C. Ewin

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

 OFW Analysis
Analytical/Primary Column

Purgeable Organic Analysis Method E601	OFW Blank 2 12/3/86 (ppb)	OFW Blank 3 12/3/86 (ppb)	OFW Blank 1 12/9/86 (ppb)
Chloromethane	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Cloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020			
Tert-Butyl Methyl Ether	NA	NA	NA
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
OFW = Organic-Free Water

Respectfully submitted,

Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

REPORT OF ANALYSIS

OFW Analysis
Analytical/Primary Column

Purgeable Organic Analysis Method E601	OFW Blank 2 12/9/86 (ppb)	OFW Blank 1 12/10/86 (ppb)	OFW Blank 1 12/15/86 (ppb)
Chloromethane	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Cloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	1.2
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL

Purgeable Organic Analysis Method SW5030/SW8020	OFW Blank 2 12/9/86 (ppb)	OFW Blank 1 12/10/86 (ppb)	OFW Blank 1 12/15/86 (ppb)
Tert-Butyl Methyl Ether	NA	NA	NA
Benzene	BMDL	No Data	BMDL
Toluene	BMDL	No Data	BMDL
Chlorobenzene	BMDL	No Data	BMDL
Ethyl Benzene	BMDL	No Data	BMDL
o-,m- and p-Xylene	BMDL	No Data	BMDL
1,3-Dichlorobenzene	BMDL	No Data	BMDL
1,2-Dichlorobenzene	BMDL	No Data	BMDL
1,4-Dichlorobenzene	BMDL	No Data	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
OFW = Organic-Free Water

Respectfully submitted,

Thomas C. Eaken

Laboratory Manager

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gnR159/91/4

 OFW Analysis
Analytical/Primary Column

Purgeable Organic Analysis Method E601	OFW Blank 1 12/16/86 (ppb)	OFW Blank 2 12/16/86 (ppb)	OFW Blank 3 12/16/86 (ppb)
Chloromethane	NA	NA	NA
Bromomethane	BMDL	No Data	BMDL
Vinyl Chloride	BMDL	No Data	BMDL
Cloroethane	BMDL	No Data	BMDL
Dichloromethane	BMDL	No Data	BMDL
1,1-Dichloroethene	BMDL	No Data	BMDL
1,1-Dichloroethane	BMDL	No Data	BMDL
Trans-1,2-Dichloroethene	BMDL	No Data	BMDL
Chloroform	1.2	No Data	BMDL
1,2-Dichloroethane	BMDL	No Data	BMDL
1,1,1-Trichloroethane	BMDL	No Data	BMDL
Carbon Tetrachloride	BMDL	No Data	BMDL
Dichlorobromomethane	BMDL	No Data	BMDL
1,2-Dichloropropane	BMDL	No Data	BMDL
Cis-1,3-Dichloropropene	BMDL	No Data	BMDL
Trichloroethene	BMDL	No Data	BMDL
Dibromochloromethane	BMDL	No Data	BMDL
1,1,2-Trichloroethane	BMDL	No Data	BMDL
Trans-1,3,-Dichloropropene	BMDL	No Data	BMDL
2-Chloroethylvinyl Ether	BMDL	No Data	BMDL
Bromoform	BMDL	No Data	BMDL
1,1,2,2-Tetrachloroethene	BMDL	No Data	BMDL
1,1,2,2-Tetrachloroethane	BMDL	No Data	BMDL
Purgeable Organic Analysis Method SW5030/SW8020			
Tert-Butyl Methyl Ether	NA	NA	NA
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
OFW = Organic-Free Water

Respectfully submitted,

Thomas C. Ewbins
Laboratory Manager

The information shown on this sheet is test data only and no interpretation of this data is intended or implied.

gnR159/91/5

REPORT OF ANALYSIS OFW Analysis
Analytical/Primary Column

Purgeable Organic Analysis Method E601	OFW Blank 1 12/17/86 (ppb)	OFW Blank 2 12/17/86 (ppb)	OFW Blank 1 12/18/86 (ppb)
Chloromethane	NA	NA	NA
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Cloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene	BMDL	BMDL	BMDL
Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane	BMDL	BMDL	BMDL
1,1,2-Trichloroethane	BMDL	BMDL	BMDL
Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020			
Tert-Butyl Methyl Ether	NA	NA	NA
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
NA = Not Analyzed
OFW = Organic-Free Water

Respectfully submitted,

Thomas E. Conklin
Laboratory Manager

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gnR159/91/6

BLANKS -

CONFIRMATION COLUMN

CH2M HILL ENVIRONMENTAL LABORATORIES
7201 N.W. 11th Place, P.O. Box 1647
Gainesville, Florida 32602
904/377-2442

Number of Samples: 9
Date Reported: 1/20/87

REPORT OF ANALYSIS

Client: Moody Air Force Base
Attention: Bill McElroy
Address: CH2M HILL Gainesville Office

Project No. FC21222.CO

Description of Sample: Organic-Free Water Analysis
Confirmation Column

Purgeable Organic Analysis Method E601	OFW Blank 1 12/3/86 (ppb)	OFW Blank 1 12/4/86 (ppb)	OFW Blank 3 12/5/86 (ppb)
Chloromethane	BMDL	BMDL	BMDL
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Chloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene and Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL = Below Method Detection Limit
OFW = Organic-Free Water

Respectfully submitted,

Laboratory Manager

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 OFW Analysis
Confirmation Column

Purgeable Organic Analysis Method SW5030/SW8020	OFW Blank 1 12/3/86 (ppb)	OFW Blank 1 12/4/86 (ppb)	OFW Blank 3 12/5/86 (ppb)
Tert-Butyl Methyl Ether	BMDL	BMDL	BMDL
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	2.6	BMDL	BMDL
o-,m- and p-Xylene	3.1	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

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Laboratory Manager

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    OFW Analysis
Confirmation Column

Purgeable Organic Analysis Method E601	OFW Blank 1 12/8/86 (ppb)	OFW Blank 1 12/16/86 (ppb)	OFW Blank 2 + 50 µl MeOH 12/16/86 (ppb)
Chloromethane	BMDL	BMDL	BMDL
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Cloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene and Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethene and 1,1,2,2-Tetrachloroethane	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020			
Tert-Butyl Methyl Ether	BMDL	BMDL	BMDL
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	1.3
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
OFW = Organic-Free Water

Respectfully submitted,

Laboratory Manager

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 OFW Analysis
Confirmation Column

Purgeable Organic Analysis Method E601	OFW Blank 1 12/17/86 (ppb)	OFW Blank 2 12/17/86 (ppb)	OFW Blank 3 12/17/86 (ppb)
Chloromethane	BMDL	BMDL	BMDL
Bromomethane	BMDL	BMDL	BMDL
Vinyl Chloride	BMDL	BMDL	BMDL
Cloroethane	BMDL	BMDL	BMDL
Dichloromethane	BMDL	BMDL	BMDL
1,1-Dichloroethene	BMDL	BMDL	BMDL
1,1-Dichloroethane	BMDL	BMDL	BMDL
Trans-1,2-Dichloroethene	BMDL	BMDL	BMDL
Chloroform	BMDL	BMDL	BMDL
1,2-Dichloroethane	BMDL	BMDL	BMDL
1,1,1-Trichloroethane	BMDL	BMDL	BMDL
Carbon Tetrachloride	BMDL	BMDL	BMDL
Dichlorobromomethane	BMDL	BMDL	BMDL
1,2-Dichloropropane	BMDL	BMDL	BMDL
Cis-1,3-Dichloropropene and Trichloroethene	BMDL	BMDL	BMDL
Dibromochloromethane and 1,1,2-Trichloroethane and Trans-1,3,-Dichloropropene	BMDL	BMDL	BMDL
2-Chloroethylvinyl Ether	BMDL	BMDL	BMDL
Bromoform	BMDL	BMDL	BMDL
1,1,2,2-Tetrachloroethane and 1,1,2,2-Tetrachloroethene	BMDL	BMDL	BMDL
Purgeable Organic Analysis Method SW5030/SW8020			
Tert-Butyl Methyl Ether	BMDL	BMDL	BMDL
Benzene	BMDL	BMDL	BMDL
Toluene	BMDL	BMDL	BMDL
Chlorobenzene	BMDL	BMDL	BMDL
Ethyl Benzene	BMDL	BMDL	BMDL
o-,m- and p-Xylene	BMDL	BMDL	BMDL
1,3-Dichlorobenzene	BMDL	BMDL	BMDL
1,2-Dichlorobenzene	BMDL	BMDL	BMDL
1,4-Dichlorobenzene	BMDL	BMDL	BMDL

NOTE: Method Detection Limit = 1 ppb
unless specified otherwise
ppb = Parts per billion
BMDL= Below Method Detection Limit
OFW = Organic-Free Water

Respectfully submitted,

Thomas C. Eaken

Laboratory Manager

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gnR159/90/4

STANDARD RESPONSE FACTORS

PRIMARY/ANALYTICAL COLUMN

NOTES:

1.	Std. #:	Reference number of standard in laboratory standards logbook
2.	Response Factor:	Ratio of concentration to area; automatically calculated by Varian DS601 data system; used to calculate results in analytical runs
3.	M.U.:	"Manually updated;" response factor from current standard entered manually into data system by GC operators (if the current response factor is within ten percent of the previous response factor, the current response factor is entered automatically by the data system)

RESPONSE FACTOR SHEET
601/602

Date	12/1/86		12/2/86		12/3/86 (Heated Purge)		12/4/86	
Std. #	1-22		1-22 (Heated Purge)		1-22 (24+16)		1-23	
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.
CH_3Cl	ND		ND		ND		ND	
CH_3Br	2.738	✓	3.873	✓	6.001	✓	0.459	✓
Vinyl Cl.	5.654		5.661		9.931	✓	0.355	
Cl. Ethane	2.978		5.249		4.729	✓	0.926	
DCM	1.076		1.759		1.658	✓	0.638	
1,1-DCE =	1.415		2.216		2.166u		0.482	
1,1-DCE	0.753		0.707		0.923u		0.604	
t-1,2-DCE =	0.786		0.928		1.164u		0.461	
$CHCl_3$	0.505		0.438		0.621u		0.405	
1,2-DCE	0.596		0.838		1.061	✓	0.499	
1,1,1-TCE	0.534		0.561		0.840u		0.386	
CCl_4	0.409		0.360		0.529u		0.318	
DCBM	1.510		0.635		0.870u		0.578	
1,2-DCP	0.528		0.518		0.709u		0.410	
c-1,3-DCP =	0.883		0.688		0.823u		0.739	
TCE =	0.466		0.579		0.835u		0.375	
DBCM	0.779		0.674		0.781u		0.657	
1,1,2-TCE	0.749		0.673		0.723u		0.654	
t-1,3-DCP =	0.554		0.471		0.613u		0.482	
2-CEVE	2.806		7.250		6.539	✓	4.840	
$CHBr_3$	1.821		1.458		1.360u	✓	1.635	
1,1,2,2-TCE =	0.402		0.485		0.717u		0.336	
1,1,2,2-TCE	1.134		0.949		0.835u		0.995	
CB	0.966		0.965		1.396u		0.805	
1,3-DCB	0.494		0.441		0.638u		0.412	
1,2-DCB	0.398		0.365		0.510u		0.343	
1,4-DCB	0.353		0.323		0.468	✓	0.306	
Tert-BME	ND		ND		ND		ND	
Benzene	0.338u		0.339u		0.356u		0.305	✓
Toluene	0.425u		0.404	✓	0.427u		0.399	✓
CB	0.470u		0.442	✓	0.447u		0.440u	
EB	0.502u		0.378	✓	0.501	✓	0.475	✓
m,p-Xylene	0.435u		0.369	✓	0.430	✓	0.412u	
o,p-Xylene	0.496u		0.443	✓	0.483u		0.466u	
1,3-DCB	0.267u		0.247	✓	0.238u		0.244u	
1,2-DCB	0.346u		0.327	✓	0.284	✓	0.325	✓
1,4-DCB	0.301u		0.269	✓	0.262		0.284	✓

RESPONSE FACTOR SHEET

601/602

Date 12-6-86 Std. # 1-23	GC#2		12-7-86 1-23		12-8-86 1-23		12-9-86 1-23 #1	
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.
CH_3Cl	ND		ND		ND		ND	
CH_3Br	0.362872 U		0.317	✓	0.538u		0.350	✓
Vinyl Cl.	0.408574	✓	0.528	✓	0.588	✓	0.527	✓
Cl. Ethane	0.931476 U		1.165	✓	1.052	✓	0.966	✓
DCM	0.572885 U		0.600u		0.663	✓	0.623	✓
1,1-DCE =	0.476920 U		0.558	✓	0.570u		0.544u	
1,1-DCE	0.606790 U		0.660	✓	0.677u		0.630	✓
t-1,2-DCE =	0.464108 U		0.549	✓	0.557u		0.520	✓
$CHCl_3$	0.451648	✓	0.498	✓	0.460	✓	0.469u	
1,2-DCE	0.498844 U		0.532	✓	0.452	✓	0.445u	
1,1,1-TCE	0.429576	✓	0.494	✓	0.425	✓	0.422u	
CCl_4	0.347299	✓	0.421	✓	0.345	✓	0.336u	
DCBM	0.636480	✓	0.700	✓	0.625	✓	0.591	✓
1,2-DCP	0.444164	✓	0.511	✓	0.453	✓	0.412u	
c-1,3-DCP =	0.867960	✓	0.984u		0.848	✓	0.846u	
TCE =	0.385847 U		0.460	✓	0.400	✓	0.386u	
DBCM	~~0.731865~~	✓	0.755u		0.668	✓	0.642u	
1,1,2-TCE	0.747635	✓	0.696	✓	0.724u		0.732u	
t-1,3-DCP =	0.548108		0.597	✓	0.496	✓	0.492u	
2-CEVE			4.436u		3.628	✓	3.987	✓
$CHBr_3$	1.810802	✓	1.661	✓	1.836	✓	1.812u	
1,1,2,2-TCE =	0.339181 U		0.405	✓	0.329	✓	0.301	✓
1,1,2,2-TCE	1.184458	✓	0.959	✓	0.888	✓	0.967	✓
CB	0.888571	✓	1.016	✓	0.811	✓	0.789u	
1,3-DCB	0.453669	✓	0.499	✓	0.456	✓	0.439u	
1,2-DCB	0.374078	✓	0.405	✓	0.342	✓	0.331u	
1,4-DCB	0.331531	✓	0.369	✓	0.304	✓	0.285	✓
Tert-BME	~~7.427258~~ ND	✓	~~7.442218~~ ND	✓	ND		ND	
Benzene	0.319603 U		0.293	✓	0.301u		0.285	✓
Toluene	0.403772 U		0.363	✓	0.366u		0.350u	
CB	0.447743 U		0.399	✓	0.401u		0.395u	
EB	0.469936 U		0.431	✓	0.421u		0.414u	
-Xylene MP	0.408646 U		0.372	✓	0.382u		0.379u	
o,p-Xylene	0.468959 U		0.416	✓	0.433u		0.424u	
1,3-DCB	0.249852 U		0.211	✓	0.322	✓	0.298	✓
1,2-DCB	0.330832 U		0.271	✓	0.389	✓	0.368	✓
1,4-DCB	0.284087 U		0.241	✓	0.302	✓	0.286	✓

GC#2

RESPONSE FACTOR SHEET
601/602

Date	12/9/86 #2		12/10/86 #1		12/10/86 #2			
Std. #	1-23 +50ul MeOH		1-23 +50ul MeOH		1-23			
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.
CH_3Cl	ND		ND		ND		ND	
CH_3Br	0.494	✓	0.422	✓	0.423	✓		
Vinyl Cl.	0.615	✓	0.591u		0.627056			
Cl. Ethane	1.032	✓	1.103	✓	1.242			
DCM	0.636u		0.623u		0.740			
1,1-DCE =	0.566u		0.573u		0.615			
1,1-DCE	0.620u		0.641u		0.709			
t-1,2-DCE =	0.537u		0.531u		0.581			
$CHCl_3$	0.522	✓	0.453	✓	0.497			
1,2-DCE	0.503	✓	0.497u		0.567			
1,1,1-TCE	0.477	✓	0.452	✓	0.501			
CCl_4	0.388	✓	0.373u		0.405			
DCBM	0.678	✓	0.629	✓	0.697			
1,2-DCP	0.480	✓	0.459u		0.509			
c-1,3-DCP =	0.882u		0.822	✓	0.877			
TCE =	0.440	✓	0.417	✓	0.457			
DBCM	0.749	✓	0.771u		0.774			
1,1,2-TCE	0.752u		0.705	✓	0.754			
t-1,3-DCP =	0.562	✓	0.531	✓	0.576			
2-CEVE	4.055u		4.243u		4.454			
$CHBr_3$	1.875u		1.806u		1.836			
1,1,2,2-TCE =	0.359	✓	0.353u		0.378			
1,1,2,2-TCE	0.953u		0.953u		0.984			
CB	0.960	✓	0.949u		0.987			
1,3-DCB	0.487	✓	0.458	✓	0.481			
1,2-DCB	0.372	✓	0.377u		0.399			
1,4-DCB	0.331	✓	0.335u		0.359	✓		
Tert-BME	ND		ND		ND			
Benzene	0.296u		0.308u		0.312	✓		
Toluene	0.358u		0.371u		0.383			
CB	0.404u		0.417u		0.413			
EB	0.327	✓	0.349	✓	0.455			
Xylene mp	0.335	✓	0.353	✓	0.399			
-Xylene o	0.409u		0.425u		0.437			
1,3-DCB	0.299u		0.308u		0.305			
1,2-DCB	0.379u		0.378u		0.366			
1,4-DCB	0.283u		0.296u		0.294	✓		

RESPONSE FACTOR SHEET

601/602

GC#2

Date	12/15/86		12/16/86		12/17/86		12/18/86	
Std. #	1-23		1-23		1-23		1-24	
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.
CH_3Cl	ND		~~LOST~~ ND	*	ND		ND	
CH_3Br	0.641	✓	0.7340	✓	0.980	✓	0.701	—
Vinyl Cl.	1.153	✓	1.098	✓	1.562		0.954	—
Cl. Ethane	1.330 u		1.384 u		1.701		1.176	—
DCM	0.756 u		0.771 u		0.877		0.643	—
1,1-DCE =	0.666 u		0.688 u		0.841		0.52662	—
1,1-DCE	0.732	✓	0.718 u		0.760		0.625	—
t-1,2-DCE =	0.581	✓	0.615	✓	0.696		0.543	—
$CHCl_3$	0.439	✓	0.486	✓	0.644		0.508	—
1,2-DCE	0.504	✓	0.551	✓	0.643		0.548	✓
1,1,1-TCE	0.438	✓	0.461	✓	0.560		0.470	✓
CCl_4	0.367	✓	0.385 u		0.475		0.397	—
DCBM	0.602	✓	0.627 u		0.743		0.649	—
1,2-DCP	0.449	✓	0.473	✓	0.566		0.490	—
c-1,3-DCP =	0.859	✓	0.846 u		0.941		0.823	—
TCE =	0.400	✓	0.429	✓	0.527		0.440	—
DBCM	0.703	✓	0.699 u		0.804		0.649	—
1,1,2-TCE	0.734 u		0.731 u		0.834		0.740	—
t-1,3-DCP =	0.529	✓	0.544 u		0.615		0.558	—
2-CEVE	4.308	✓	4.123 u		5.002		3.876	—
$CHBr_3$	1.744	✓	1.731 u		1.904		1.741	—
1,1,2,2-TCE =	0.331	✓	0.362	✓	0.418		0.381	—
1,1,2,2-TCE	1.035 u		1.008 u		0.966 u		1.034	—
CB	0.957	✓	0.891	✓	1.056	✓	0.949	—
1,3-DCB	0.469	✓	0.452 u		0.525		0.477	—
1,2-DCB	0.343	✓	0.359	✓	0.401		0.373	—
1,4-DCB	0.367 u		0.346 u	*	0.359		0.333	✓
Tert-BME	ND		~~[illegible]~~		ND		ND	
Benzene	0.311 u		0.30974 u		0.325 u		0.299	
Toluene	0.376 u		0.36697 u		0.403 u		0.394 u	
CB	0.398 u		0.42198 u		0.435 u		0.432 u	
EB	0.429 u		0.45846	—	0.479	✓	0.488 u	
m-Xylene mp	0.378 u		0.3989	—	0.412 u		0.406 u	
o-Xylene o	0.429 u		0.45335	—	0.467 u		0.476 u	
1,3-DCB	0.278 u		0.2720 u		0.261 u		0.251	✓
1,2-DCB	0.341 u		0.2758 u		0.322	✓	~~0.275~~ 0.303 u	
1,4-DCB	0.270	✓	0.3400 u		0.281 u		~~0.323~~ u	

STANDARD RESPONSE FACTORS

CONFIRMATION COLUMN

NOTES:

1.	Std. #:	Reference number of standard in laboratory standards logbook
2.	Response Factor:	Ratio of concentration to area; automatically calculated by Varian DS601 data system; used to calculate results in analytical runs
3.	M.U.:	"Manually updated;" response factor from current standard entered manually into data system by GC operators (if the current response factor is within ten percent of the previous response factor, the current response factor is entered automatically by the data system)

GC#1

RESPONSE FACTOR SHEET

601/602

Heated/Soil

Date	12/3/86		12/4/86		12/7/86		12/5/86	
Std. #	1-22		1-23		1-23		1-23	
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.
CH_3Cl	ND		3.965		3.512	✓	1.102	✓
CH_3Br	6.736	✓	0.901		0.947	✓	0.727	✓
Vinyl Cl.	4.528	✓	0.435		0.624	✓	0.523	✓
Cl. Ethane	2.836	✓	0.689		0.834	✓	0.649u	
DCM	0.690	✓	0.527		0.603	✓	0.498u	
1,1-DCE =	1.124	✓	0.501		0.646	✓	0.569	✓
1,1-DCE	0.696	✓	0.562		0.713	✓	0.624	✓
t-1,2-DCE =	0.912	✓	0.615		0.822	✓	0.629	✓
$CHCl_3$	0.340	✓	0.305		0.373u		0.350	✓
1,2-DCE	0.586	✓	0.456		0.511	✓	0.452u	
1,1,1-TCE	0.553	✓	0.455		0.555u		0.507	✓
CCl_4	0.404	✓	0.366u		0.450u		0.413	✓
DCBM	0.466	✓	0.415		0.489u		0.450u	
1,2-DCP	0.638	✓	0.519		0.618u		0.569u	
c-1,3-DCP =	0.708	✓	0.643u		0.720u			
TCE =							0.787	✓
DBCM								
1,1,2-TCE	0.710	✓	0.551		0.665u		0.585u	
t-1,3-DCP =								
2-CEVE	5.440	✓	4.179		[illegible]	✓	2.384	✓
$CHBr_3$	1.091	✓	0.749		[illegible]		0.683u	
1,1,2,2-TCE =					[illegible]			
1,1,2,2-TCE	0.497	✓	0.404				0.418u	
CB	0.913u		0.835u		[illegible]		0.903u	
1,3-DCB	0.371u		0.354u		[illegible]		0.366u	
1,2-DCB	0.352	✓	0.311		0.337u		0.323u	
1,4-DCB	0.234u		0.225u		0.260u		0.243u	
Tert-BME	8.757	✓	4.746	✓	9.551u		10.266	✓
Benzene	1.904	✓	1.438	✓	2.451u		2.281	✓
Toluene	2.318	✓	1.994	✓	3.404u		3.307	✓
CB	2.262	✓	1.878	✓	3.208u		3.101	✓
EB	1.732	✓	2.008	✓	3.584	✓	2.369	✓
m-Xylene	1.508	✓	1.609u		2.644	✓	2.164	✓
o,p-Xylene	1.967u		1.913u		3.106u		2.860	✓
1,3-DCB	1.352	✓	1.159	✓	1.855u		1.815	✓
1,2-DCB	1.933	✓	1.476	✓	2.327u		2.264	✓
1,4-DCB	1.247	✓	1.132u		1.753u		1.709	✓

GC#1

RESPONSE FACTOR SHEET
601/602

Date / Std. # changed lamp	12/8/86 Heated 1-23 all 52		12/9/86 Heated 1-23		12/10/86 Heated 1-23		12/11/86 Heated 1-23	
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor-	M.U
CH_3Cl	4.041	✓	3.678u		5.268	✓	6.874	✓
CH_3Br	0.890u		1.127	✓	1.044u		1.208	✓
Vinyl Cl.	0.559	✓	0.730	✓	0.732u		0.815	✓
Cl. Ethane	0.779u		0.907	✓	0.828u		0.881u	
DCM	0.541	✓	0.622	✓	0.541	✓	0.591u	
1,1-DCE =	0.558	✓	0.703	✓	0.672u		0.676u	
1,1-DCE	0.595	✓	0.741	✓	0.644	✓	0.714	✓
t-1,2-DCE =	0.677	✓	0.861	✓	0.820u		0.819u	
$CHCl_3$	0.313	✓	0.390	✓	0.386u		0.365u	
1,2-DCE	0.428	✓	0.526	✓	0.478u		0.484u	
1,1,1-TCE	0.485u		0.604	✓	0.630u		0.570u	
CCl_4	0.363	✓	0.473	✓	0.492u		0.432	✓
DCBM	0.399	✓	0.529	✓	0.539u		0.477	✓
1,2-DCP	0.519	✓	0.622	✓	0.573u		0.610u	
c-1,3-DCP = / TCE =	0.638	✓	0.817	✓	0.812u		0.722	✓
DBCM / 1,1,2-TCE / t-1,3-DCP =	0.499	✓	0.639	✓	0.632u		0.564	✓
2-CEVE	1.382	✓	2.445	✓	2.317u		1.623	✓
$CHBr_3$	0.517	✓	0.706	✓	0.707u		0.577	✓
1,1,2,2-TCE = / 1,1,2,2-TCE	0.348	✓	0.452	✓	0.441u		0.405u	
CB	0.754	✓	0.969	✓	0.927u		0.918u	
1,3-DCB	0.330	✓	0.409	✓	0.398u		0.386u	
1,2-DCB	0.286	✓	0.344	✓	0.337u		0.325u	
1,4-DCB	0.212	✓	0.263	✓	0.261u		0.254u	
Tert-BME	1.758	✓	1.798u		1.727u		1.751u	
Benzene	0.413		0.432u		0.468u		0.496u	
Toluene	0.583		0.591u		0.631u		0.620u	
CB	0.539		0.546u		0.582u		0.562u	
EB	0.580		0.501	✓	0.605	✓	0.529	✓
m-Xylene	0.453		0.415u		0.487	✓	0.437	✓
o,p-Xylene	0.529		0.542u		0.586u		0.558u	
1,3-DCB	0.305		0.321u		0.347u		0.322u	
1,2-DCB	0.366		0.396u		0.426u		0.409u	
1,4-DCB	0.296		0.307u		0.331u		0.308u	

GC#1

RESPONSE FACTOR SHEET
601/602

Date Std. #	12/12/86 1-23		12/15/86 1-23		12/16/86 1-23		12/16/86 1-23 +50µl MEOH	
Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor -	M.U.
CH_3Cl	8.390	✓	5.890	✓	8.861 u		7.395	✓
CH_3Br	1.378		1.410u		1653	✓	1.767u	
Vinyl Cl.	0.945		1.027u		1116	✓	1.218u	
Cl. Ethane	1.111		1.054u		1178 u		1.255u	
DCM	0.664		0.652u		0.659 u		0.672u	
1,1-DCE =	0.773		0.783u		0.777 u		0.817u	
1,1-DCE	0.774u		0.798u		0.757 u		0.788u	
t-1,2-DCE =	0.890u		0.948u		0.870 u		0.886u	
$CHCl_3$	0.345u		0.389u		0.384 u		0.405u	
1,2-DCE	0.551	✓	0.552u		0.554 u		0.544u	
1,1,1-TCE	0.545u		0.639u		0.582 u		0.609u	
CCl_4	0.507	✓	0.483u		0.459 u		0.463u	
DCBM	0.565	✓	0.529u		0.501 u		0.509u	
1,2-DCP	0.668u		0.678u		0.654 u		0.651u	
c-1,3-DCP =	0.857	✓	0.855u		0.826 u		0.829u	
TCE =								
DBCM								
1,1,2-TCE	0.683	✓	0.677u		0.660 u		0.647u	
t-1,3-DCP =								
2-CEVE	2.200	✓	1.982u		~~0~~2.170	✓	2.248u	
$CHBr_3$	0.817	✓	0.746u		0.819	✓	0.777u	
1,1,2,2-TCE =	0.519	✓	0.514u		0.506 u		0.506u	
1,1,2,2-TCE								
CB	1.029	✓	1.000 u		0.986 u		0.979u	
1,3-DCB	0.428	✓	0.417u		0.390 u		0.396u	
1,2-DCB	0.375	✓	0.364u		0.340 u		0.353u	
1,4-DCB	0.277u		0.272u		0.266 u		0.264u	
Tert-BME	1.802u		2.249	✓	2.989	✓	2.813u	
Benzene	0.422u		0.524	✓	0.619	✓	0.642u	
Toluene	0.583u		0.695	✓	0.786	✓	0.763u	
CB	0.545u		0.603	✓	0.681	✓	0.564	✓
EB	0.464	✓	0.623u		0.467	✓	0.568	✓
m-Xylene	0.406u		0.501	✓	0.550 u		0.552u	
o,p-Xylene	0.541u		0.633	✓	0.703	✓	0.723u	
1,3-DCB	0.291	✓	0.367	✓	0.418	✓	0.441u	
1,2-DCB	0.410 u	✓	0.465	✓	0.945	✓	0.563u	
1,4-DCB	0.314 u	✓	0.357	✓	0.406	✓	0.423u	

RESPONSE FACTOR SHEET
601/602

GC # 1

Parameter	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.	Response Factor	M.U.
Date	12/18/86		12/17/86		12/19/86		12/20/86	
Std. #	1-24		1-23		1-24			
CH_3Cl	5.608	✓	8.477u		6.265	✓	8.024	✓
CH_3Br	1.848	✓	1.564u		1.200	✓	2.166U	
Vinyl Cl.	1.045 u		1.120u		1.093	✓	1.223	✓
Cl. Ethane	1.294 u		1.234u		1.347	✓	1.478 u	
DCM	0.663 u		0.667u		0.687u		0.697u	
1,1-DCE =	0.619	✓	0.780u		0.641	✓	0.689u	
1,1-DCE	0.696 u		0.719u		0.722u		0.763u	
t-1,2-DCE =	0.738	✓	0.822u		0.777u		0.832u	
$CHCl_3$	0.384 u		0.369u		0.400u		0.422u	
1,2-DCE	0.655 u		0.601u		0.689u		0.662u	
1,1,1-TCE	0.537 u		0.548u		0.565u		0.585u	
CCl_4	0.424 u		0.422u		0.428u		0.445u	
DCBM	0.548 u		0.500u		0.571u		0.545u	
1,2-DCP	0.678 u		0.624u		0.710u		0.687u	
c-1,3-DCP =	0.824 u		0.777u		0.840u		0.849u	
TCE =								
DBCM							0.834u	
1,1,2-TCE	0.872	✓	0.724u		0.897u			
t-1,3-DCP =								
2-CEVE	4.238	✓	3.717	✓	4.595u		3.875	✓
$CHBr_3$	1.204	✓	0.973	✓	1.268u		1.158 u	
1,1,2,2-TCE =	0.576	✓	0.515u				0.595u	
1,1,2,2-TCE					0.600u			
CB	1.015 u		0.932u		1.056u		1.042 u	
1,3-DCB	0.434	✓	0.387u		0.430u		0.439 u	
1,2-DCB	0.428	✓	0.368u		0.425u		0.422 u	
1,4-DCB	0.295	✓	0.264u		0.299u		0.290 u	
Tert-BME	4.592	✓	3.549	✓	5.312	✓	10.437	✓
Benzene	0.762 u		0.710	✓	0.853		0.843 u	
Toluene	0.960	✓	0.849u		1.079		1.082 u	
CB	0.933	✓	0.758	✓	1.075		1.049 u	
EB	0.984	✓	0.677	✓	1.127		1.166 u	
m-Xylene	0.742	✓	0.584 u		0.845		0.866 u	
o,p-Xylene	0.899	✓	0.757 u		1.015		1.036 u	
1,3-DCB	0.5~~37~~72	✓	0.440 u		0.643		0.638 u	
1,2-DCB	0.805	✓	0.627	✓	0.901		0.874 u	
1,4-DCB	0.558	✓	0.404u		0.630		0.615 u	

EPA QUALITY CONTROL RESULTS

CONFIRMATION COLUMN

NOTES:

1.	Ref. No.:	Refers to the EPA QC sample identification number (the daily QC sample is prepared by combining several EPA QC samples)
2.	Result (ppb):	GC result
3.	True Value (ppb):	Target value provided by EPA
4.	% Recovery:	Result/True Value x 100%
5.	95% Conf. Interval:	Acceptable range of values provided by EPA (not all EPA QC samples include this information)

QUALITY CONTROL DATA

GC#2

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/2/86	781-4					
DCM		879-2	60	40	150		
11-DCE=		281-6	35	21	167		
T-12 DCE=			82	55	149		
12 DCE			20	25	80		
CCL4			24	27	89		
12 DCP			40	40	100		
TCE=			43	50	86		
DBCM			22	30	73		
1122 TCE			48	51	94		
CB			31	40	78		
Benz			13	12	108		
Tol			37	37	100		
EB			23	33	70		
Total Xy			49	57	86		
12 DCB			—	—	—		
13 DCB			72	120	60		
14 DCB			30	52	58		
CB			42	40	105		

*Outside 95% Confidence Interval

QUALITY CONTROL DATA

GC#2

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/3/86	781-4					
DCM		281-6	49	40	123		
11-DCE=		879-2	29	21	138		
T-12 DCE=			86	55	156		
12 DCE			23	25	92		
CCL4			28	27	104		
12 DCP			46	40	115		
TCE =			49	50	98		
DBCM			24	30	80		
1122 TCE			51	51	100		
CB			36	40	90		
Benz			14	12	117		
Tol			41	37	111		
EB			31	33	94		
Tot Xyl			57	57	100		
12 DCB			—	—	—		
13 DCB			72	120	60		
14 DCB			32	52	62		
CB			43	40	108		

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

GC#2

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/9/86	879-2					
Br Meth		281-4	ND	29	—	13-42	
11-DCE		1079-3	38	35	109	16-50	
CHCl3			65	45	144	20-65	
12-DCP			48	63	76	28-91	
T-12-DCP= C-12-DCP=			~~10~~	~~81~~	~~12~~	~~37-118~~	
1122-TCE			65	55	119		
CB			38	45	84		
Benz			13	12	108	6-18	
Tol			42	37	114	21-50	
EB			35	33	106	15-48	
tot xy			63	57	111	—	
12 DCB			55	100	55	51-136	
13 DCB			38	75	51	44-100	
14 DCB			38	80	48	44-105	
CB			62	45	138		

*Outside 95% Confidence Interval

mR159B/Forms/5

QUALITY CONTROL DATA

GC#2

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/10/86	781-4					
DCM		878-2	36	40	90		
11-DCE=		281-6	21	21	100		
T-12-DCE=			65	55	118		
12 DCE			22	25	88		
CCL4			25	27	93		
12 DCP			41	40	103		
TCE=			45	50	90		
DBCM			25	30	83		
1122TCE			53	51	104		
CB			36	40	90		
Benz			11	12	92		
Tol			41	37	111		
EB			28	33	85		
Tot xy			59	57	104		
12 DCB			—	—	—		
13 DCB			61	120	51		
14 DCB			30	52	58		
CB			48	40	120		

*Outside 95% Confidence Interval

EPA QUALITY CONTROL RESULTS

PRIMARY/ANALYTICAL COLUMN

NOTES:

1.	Ref. No.:	Refers to the EPA QC sample identification number (the daily QC sample is prepared by combining several EPA QC samples)
2.	Result (ppb):	GC result
3.	True Value (ppb):	Target value provided by EPA
4.	% Recovery:	Result/True Value x 100%
5.	95% Conf. Interval:	Acceptable range of values provided by EPA (not all EPA QC samples include this information)

QUALITY CONTROL DATA

GC#1

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/3/86	781-4					
DCM		281-6	55	40	138		
11-DCE=		879-2	50	21	238		
T-12-DCE=			113	55	205		
12 DCE			30	25	120		
CCL4			34	27	126		
12DCP			50	40	125		
TCE =			96	50	192		
DBCM			38	30	127		
1122TCE			25	51	49		
CB			44	40	110		
Benz			11	12	92		
Tol			41	37	111		
EB			26	33	79		
Tot Xy			51	57	89		
12 DCB			–	–	–		
13 DCB			61	120	51		
14 DCB			23	52	44		
CB			46	40	115		

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

GC#1

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/9/86	781-4					
DCM		878-2	41	40	103		
11-DCE=		281-6	20	21	95		
T-12-DCE=			71	55	129		
12 DCE			27	25	108		
CCL4			28	27	104		
12 DCP			42	40	105		
TCE=			83	50	166		
DBCM			35	30	117		
1122 TCE			38	51	75		
CB			39	40	98		
Benz			9.6	12	80		
Tol			39	37	105		
EB			30	33	91		
Tot Xy			53	57	93		
12 DCB			—	—	—		
13 DCB			61	120	51		
14 DCB			25	52	48		
CB			42	40	105		

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

Date: 12/5/86
Ref No: 781-4 (half strength)
879-2 281-6

Parameter	Result GC #1 (ppb)	Result GC #2 (ppb)	True Value (ppb)	% Rec. GC #1	% Rec. GC #2	95% Conf. Interval	Comments
DCM	21		20	105			
11-DCE =	10		12	83			
T-12-DCE =	33		28	118			
12 DCE	13		13	100			
CCL4	14		14	100			
12 DCP	20		20	100			
TCE =	46		25	184			
DBCM	19		15	127			
1122 TCE	26		26	100			
CB	19		20	95			
Benz	9.8		12	82			
Tol	40		37	108			
EB	25		33	76			
Total Xyl	54		57	95			
12 DCB	–		–	–			
13 DCB	65		120	54			
14 DCB	26		52	50			
CB	22		20	110			

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

GC#1

Parameter	Date	Ref. No.	Result (ppb)	True Value (ppb)	% Rec.	95% Conf. Interval	Comments
	12/8/86	781-4					
DCM		878-2	44	40	110		
11-DCE=		281-6	23	21	110		
T-12-DCE=			77	55	140		
12 DCE			27	25	108		
CCL4			28	27	104		
12 DCP			42	40	105		
TCE=			85	50	170		
DBCM			35	30	117		
1122 TCE			47	51	92		
CB			38	40	95		
Benz			9.6	12	80		
Tol			38	37	103		
EB			34	33	103		
Tot xy			54	57	95		
12 DCB			—	—	—		
13 DCB			61	120	51		
14 DCB			27	52	52		
CB			44	40	110		

*Outside 95% Confidence Interval

gnR159B/Forms/5

EPA QUALITY CONTROL RESULTS

COMBINED DATA

PRIMARY/ANALYTICAL COLUMN = GC#2

CONFIRMATION COLUMN = GC#1

QUALITY CONTROL DATA

Date: 12/15/86
Ref No: 781-4 281-5 879-2

Parameter	Result GC #1 (ppb)	Result GC #2 (ppb)	True Value (ppb)	% Rec. GC #1	% Rec. GC #2	95% Conf. Interval	Comments
DCM	51	42	40	128	105		
11-DCE=	29	21	21	138	100		
T-12-DCE=	94	90	55	171	164		
12-DCE	30	24	25	120	96		
CCL4	33	28	27	122	104		
12-DCP	46	46	40	115	115		
TCE=	93	50	50	186	100		
DBCM	39	23	30	130	77		
1122TCE	45	44	51	88	86		
C Benz	40	41	40	100	103		
Benz	9.7	11	12	81	92	5.8-18	
Tol	38	37	37	103	100	21-50	
EB	28	29	33	85	88	15-48	
Tot Xy	52	53	57	91	93		
CB	40	43	40	100	108		
12 DCB	34	29	60	57	48	31-82	
13 DCB	50	51	100	50	51	59-133	
14 DCB	—	0	0	—	—	—	

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

Date: 12/16/86
Ref No: 781-4 281-5
879-2

~~GC #2~~

Parameter	Result GC #1 (ppb)	Result GC #2 (ppb)	True Value (ppb)	% Rec. GC #1	% Rec. GC #2	95% Conf. Interval	Comments
DCM	49	~~23~~ 44	40	123	110		
11-DCE =	27	23	21	129	110		
T-12-DCE =	87	73	55	158	133		
12-DCE	28	23	25	112	92		
CCL4	31	24	27	115	89		
12-DCP	44	40	40	110	100		
TCE =	89	44	50	178	88		
DBCM	36	21	30	120	70		
1122TCE	37	48	51	73	94		
C Benz	40	31	40	100	78		
Benz	9.7	11	12	81	92	5.8-18	
Tol	36	39	37	97	105	21-50	
EB	19	29	33	58	88	15-48	
Tot xy	48	~~55~~	57 ~~53~~	94 ~~88~~	96		
CB	39	44	40	98	110		
12 DCB	33	34	60	55	57	31-82	
13 DCB	49	56	100	49	56	59-133	
14 DCB	—	—	0			—	

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

Date: 12/17/86
Ref No: 379-2, 381-5
381-4

Parameter	Result GC #1 (ppb)	Result GC #2 (ppb)	True Value (ppb)	% Rec. GC #1	% Rec. GC #2	95% Conf. Interval	Comments
Benzene	12	13	12	100	108	5.8 - 18	
Toluene	43	47	37	116	127	21 - 50	
EB	32	36	33	97	109	15 - 48	
Xylene	58	66	57	102	116		
1,2-DCB	32	31	60	53	52	31 - 82	
1,3-DCB	44	55	100	44	55	39 - 133	
1,4-DCB	—	—	—	—	—	—	
CB	39	41	40	98	103		
DCM	47	51	40	118	128		
1,1-DCE*	27	26	21	129	124		
t-1,2-DCE*	79	78	55	144	142		
1,2-DCE	29	27	25	116	108		
CCl4	27	26	27	100	96		
1,2-DCP	42	45	40	105	113		
TCE*	84	50	50	168	100		
DBCM	37	23	30	123	77		
1,1,2,2-TCE	31	42	51	61	82		
CB	39	35	40	98	88		
1,2-DCB	39	27	60	65	45		
1,3-DCB	51	58	100	51	58		
1,4-DCB	—	—	—	—	—		

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY CONTROL DATA

Date: 12/18/86
Ref No: 879-2, 281-5
781-4

Parameter	Result GC #1 (ppb)	Result GC #2 (ppb)	True Value (ppb)	% Rec. GC #1	% Rec. GC #2	95% Conf. Interval	Comments
Benzene	11	13	12	92	108	5.8 - 18	
Toluene	44	48	37	119	130	21 - 50	
EB	39	38	33	118	115	15 - 48	
Xylene	62	69	57	109	121		
1,2-DCB	34	38	60	57	63	31 - 82	
1,3-DCB	51	62	100	51	62	59 - 133	
1,4-DCB	—	—	—	—	—	—	
CB	42	45	40	105	113		
DCM	43	45	40	108	113		
1,1-DCE*	28	20	21	133	95		
t-1,2-DCE*	71	67	55	129	122		
1,2-DCE	26	26	25	104	104		
CCl4	28	25	27	104	93		
1,2-DCP	42	43	40	105	108		
TCE*	87	48	50	174	96		
DBCM	36	23	30	120	77		
1,1,2,2-TCE	22	46	51	43	94		
CB	39	35	40	98	88		
1,2-DCB	39	30	60	65	50		
1,3-DCB	54	62	100	54	62		
1,4-DCB	—	—	—				

*Outside 95% Confidence Interval

gnR159B/Forms/5

QUALITY ASSURANCE

PRIMARY/ANALYTICAL COLUMN

GC#2 QUALITY ASSURANCE

Date: 12/2/86
Spike #: 1-22 at 10ppb (unmultiplied value)

Sample #: 37586
Client: Moody AFB
Analysis: 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl	ND	—	—	—	—	—	—
CH_3Br	10	0	12	120	9.7	97	21
Vinyl Cl.	10		10	100	9.9	99	1.
Cl. Ethane	20		37	185	20	100	6
DCM	10		14	140	9.5	95	38
1,1-DCE =			15	150	9.5	95	4
1,1-DCE			11	110	8.7	87	2
t-1,2-DCE =			11	110	8.7	87	2
$CHCl_3$			10	100	8.5	85	1
1,2-DCE			10	100	8.8	88	1
1,1,1-TCE			10	100	8.3	83	1
CCl_4			10	100	8.5	85	1
DCBM			9.9	99	8.5	85	1
1,2-DCP			10	100	8.7	87	1
c-1,3-DCP =			9.7	97	8.3	83	1
TCE =			10	100	~~8.9~~ 9.0	90	1
DBCM			10	100	8.6	86	1
1,1,2-TCE			9.7	97	8.6	86	1
t-1,3-DCP =			10	100	8.4	84	1
2-CEVE	40		58	145	41	103	3
$CHBr_3$	10		9.9	99	9.0	90	9.
1,1,2,2-TCE =			11	110	9.5	95	1
1,1,2,2-TCE			9.3	93	9.9	99	6.
1,3-DCB			9.8	98	10	100	2.
1,2-DCB			9.6	96	9.8	98	2.
1,4-DCB			9.7	97	10	100	3
tert-BME	ND	—	—	—	—	—	—
Benzene	10	1.1	11	99	11	99	0
Toluene		0	9.9	99	9.7	97	2.
CB		0	9.6	96	9.8	98	2
EB		3.0	10	70	10	70	0
m-Xylene / o,p-Xylene	~~30~~	~~6.7~~	~~34~~	~~91~~	~~35~~	~~94~~	~~3~~
1,3-DCB	10	0	9.7	97	9.8	98	1
1,2-DCB		0	9.9	99	10	100	1
1,4-DCB		0	9.9	99	10	100	

gnR159B/Forms/11

GC#2

QUALITY ASSURANCE

Date: 12/3/86
Spike #: 1-22

Soil | H_2O

Sample #: 37590
Client: Moody AFB
Analysis: ~~12/3/86~~ 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl	ND	—	—	—	—	—	—
CH_3Br	10	0	10	100	10	100	0
Vinyl Cl.	10		10	100	8.2	82	20
Cl. Ethane	20		21	105	19	95	10
DCM	10		12	120	12	120	0
1,1-DCE =			11	110	11	110	0
1,1-DCE			10	100	9.7	97	3.0
t-1,2-DCE =			10	100	11	110	9.5
$CHCl_3$		1.1	11	99 ~~110~~	10	89 ~~100~~	11 ~~9.5~~
1,2-DCE		0	11	110	11	110	0
1,1,1-TCE		5.3	11	57 ~~110~~	11	57 ~~110~~	0
CCl_4		0	10	100	9.7	97	3.0
DCBM			10	100	10	100	0
1,2-DCP			10	100	9.9	99	1.0
c-1,3-DCP =			10	100	9.6	96	4.1
TCE =			11	110	11	110	0
DBCM			10	100	9.8	98	2.0
1,1,2-TCE			10	100	9.9	99	1.0
t-1,3-DCP =			10	100	9.9	99	1.0
2-CEVE	40		56	140	51	128	9.0
$CHBr_3$	10		10	100	9.9	99	1.0
1,1,2,2-TCE =			10	100	10	100	0
1,1,2,2-TCE			9.6	96	9.1	91	5.3
1,3-DCB			10	100	10	100	0
1,2-DCB			10	100	10	100	0
1,4-DCB			10	100	9.9	99	1
tert-BME	ND	—	—	—	—	—	—
Benzene	10	0	10	100	9.8	98	2.0
Toluene			10	100	9.9	99	1.0
CB			9.9	99	9.8	98	1.0
EB			10	100	9.8	98	2.0
m-Xylene o,p-Xylene	~~30~~		~~30~~	~~100~~	~~30~~	~~100~~	~~0~~
1,3-DCB	10		10	100	9.8	98	2
1,2-DCB			10	100	9.6	96	4.1
1,4-DCB			10	100	9.6	96	4.1

gmR159B/Forms/11

QUALITY ASSURANCE

Date: 12/9/86
Spike #: 1-23 at 10ppb
MEOH GC#2

Sample #: 37750
Client: Moody AFB
Analysis: 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl							
CH_3Br	10	0	8.8	88	9.5	95	8.7
Vinyl Cl.	10		9.7	97	9.9	99	2.0
Cl. Ethane	20		18	90	16	80	12
DCM	10		9.4	94	7.3	73	23
1,1-DCE =			9.7	97	9.5	95	2.1
1,1-DCE			9.4	94	9.1	91	3.2
t-1,2-DCE =			9.9	99	9.2	92	7.3
$CHCl_3$			10	100	9.5	95	5.1
1,2-DCE			9.5	95	8.0	80	17
1,1,1-TCE			9.9	99	9.5	95	4.1
CCl_4			10	100	9.6	96	4.1
DCBM			9.9	99	9.5	95	4.1
1,2-DCP			10	100	9.4	94	6.2
c-1,3-DCP =			10	100	10	100	0
TCE =			10	100	9.3	93	7.3
DBCM			10	100	9.9	99	1.0
1,1,2-TCE			10	100	9.7	97	3.0
t-1,3-DCP =			10	100	10	100	0
2-CEVE	40		40	100	35	88	13
$CHBr_3$	10		10	100	10	100	0
1,1,2,2-TCE =			9.9	99	9.3	93	6.3
1,1,2,2-TCE		2.3	10	77	10	77	0
1,3-DCB		0	10	100	9.8	98	2.0
1,2-DCB			9.8	98	9.4	94	4.2
1,4-DCB			9.7	97	9.5	95	2.1
tert-BME							
Benzene	10	0	9.7	97	9.5	95	2.1
Toluene	10	0	9.8	98	9.6	96	2.1
CB	10	0	9.9	99	9.7	97	2.0
EB	10	5.1	9.4	43	9.2	41	4.8
m-Xylene / o,p-Xylene	30	7.4	30	75	29	72	4.1
1,3-DCB	10	0	10	100	9.6	96	4.1
1,2-DCB			11	110	9.9	99	11
1,4-DCB			10	100	9.6	96	4.1

gnR159B/Forms/11

GC#2 **QUALITY ASSURANCE**

Sample #: 37748
Client: Moody AFB
Analysis: 601/602

Date: 12/10/86
Spike #: 1-23 at 10 ppb

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl							
CH_3Br	10	0	11	110	9.7	97	13
Vinyl Cl.	10		10	100	9.5	95	5.1
Cl. Ethane	20		24	120	24	120	0
DCM	10		12	120	11	110	9.5
1,1-DCE =			11	110	10	100	9.5
1,1-DCE			11	110	11	110	0
t-1,2-DCE =			11	110	10	100	9.5
$CHCl_3$			10	100	9.7	97	3.0
1,2-DCE			11	110	11	110	0
1,1,1-TCE			11	110	10	100	9.5
CCl_4			11	110	9.7	97	13
DCBM			14	140	13	130	7.4
1,2-DCP			11	110	10	100	9.5
c-1,3-DCP =			10	110	9.7	97	13
TCE =			11	110	10	100	9.5
DBCM			10	100	9.9	99	1.0
1,1,2-TCE			10	100	10	100	0
t-1,3-DCP =			9.4	94	9.0	90	4.3
2-CEVE	40		0	0	0	0	—
$CHBr_3$	10		10	100	10	100	0
1,1,2,2-TCE =			11	110	10	100	9.5
1,1,2,2-TCE			9.8	98	9.9	99	1.0
1,3-DCB			11	110	10	100	9.5
1,2-DCB			11	110	10	100	9.5
1,4-DCB			11	110	10	100	9.5
tert-BME							
Benzene	10		10	100	9.9	99	1.0
Toluene	10		10	100	10	100	0
CB	10		9.9	99	9.8	98	1.0
EB	10		10	100	9.9	99	1.0
m-Xylene							
o,p-Xylene	30		30	100	29	97	3.0
1,3-DCB	10		10	100	10	100	0
1,2-DCB			9.9	99	9.9	99	0
1,4-DCB			10	100	10	100	0

gnR159B/Forms/11

QUALITY ASSURANCE

Date: 12/15/86 GC#2
Spike #: 1-23 at 10 ppb

Sample #: 37800
Client: Moody AFB
Analysis: 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl	ND						
CH_3Br	10	0	12	120	12	120	0
Vinyl Cl.	10		11	110	12	120	8.7
Cl. Ethane	20		21	105	22	110	4.7
DCM	10		9.8	98	10	100	2.0
1,1-DCE =			10	100	10	100	0
1,1-DCE			9.0	90	11	110	20
t-1,2-DCE =			9.5	95	10	100	5.1
$CHCl_3$			9.1	91	9.1	91	100
1,2-DCE			9.3	93	9.1	91	2.2
1,1,1-TCE			9.2	92	9.1	91	1.1
CCl_4			9.1	91	9.0	90	1.1
DCBM			9.3	93	9.1	91	2.2
1,2-DCP			9.2	92	9.1	91	1.1
c-1,3-DCP =			9.3	93	9.4	94	1.1
TCE =			9.5	95	9.2	92	3.2
DBCM			9.6	96	9.4	94	2.1
1,1,2-TCE			9.3	93	9.4	94	1.1
t-1,3-DCP =			9.0	90	9.1	91	1.1
2-CEVE	40		33	83	35	88	5.8
$CHBr_3$	10		9.2	92	9.1	91	1.1
1,1,2,2-TCE =			9.3	93	9.0	90	3.3
1,1,2,2-TCE			8.1	81	8.7	87	7.1
1,3-DCB			9.9	99	9.8	98	1.0
1,2-DCB			9.3	93	9.2	92	1.1
1,4-DCB			11	110	11	110	0
tert-BME	ND						
Benzene	10	48	58	100	55	70	35
Toluene		0	9.3	93	9.2	92	1.1
CB		0	9.3	93	9.1	91	2.2
EB		15	25	100	24	90	11
m-Xylene / o,p-Xylene	30	32	56	80	54	73	9.[illegible]
1,3-DCB	10	0	9.9	99	9.8	98	1.0
1,2-DCB			11	110	11	110	0
1,4-DCB			11	110	11	110	0

gmR159B/Forms/11

QUALITY ASSURANCE

Date: 12/17/86
Spike #: 1-23 at 10ppb

Sample #: 37824
Client: Moody AFB
Analysis: 1~~[illegible]~~ 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl							
CH_3Br	10	0	14	140	15	150	6.9
Vinyl Cl.	10	5.0	18	130	18	130	0
Cl. Ethane	20	12	33	105	33	105	0
DCM	10	34	44	100	41	70	35
1,1-DCE =		0	12	120	12	120	0
1,1-DCE		4.8	16	112	16	112	0
t-1,2-DCE =		0	15	150	15	150	0
$CHCl_3$		0	12	120	13	130	8.0
1,2-DCE		1.7	13	113	14	123	8.5
1,1,1-TCE		0	11	110	11	110	0
CCl_4			11	110	11	110	0
DCBM			14	140	15	150	6.9
1,2-DCP			11	110	12	120	8.7
c-1,3-DCP =			10	100	11	110	9.5
TCE =		1.5	12	105	13	115	9.1
DBCM		0	10	100	11	110	9.5
1,1,2-TCE			22	220	24	240	8.7
t-1,3-DCP =			9.5	95	9.9	99	4.1
2-CEVE	40		0	—	0	—	—
$CHBr_3$	10		10	100	10	100	0
1,1,2,2-TCE =			0	—	0	—	—
1,1,2,2-TCE			9.8	98	9.5	95	3.1
1,3-DCB			10		18		
1,2-DCB			16	101	0	91	10
1,4-DCB		1.7	12		11		
tert-BME							
Benzene	10	1.5	10	85	10	85	0
Toluene		61	70	90	60	0	—
CB		0	8.9	89	9.1	91	2.2
EB		3.4	12	86	12	86	0
m-Xylene	30	11	38	90	37	87	3.4
o,p-Xylene							
1,3-DCB	10	0	9.1		12		
1,2-DCB		0	9.4	102	9.7	72	34
1,4-DCB		0	12		0		

gnR159B/Forms/11

QUALITY ASSURANCE

CONFIRMATION COLUMN

Sample #: [illegible]
Date: 12/3/86
Spike #: 1-22
Client: Moody AFB
Analysis: 601/602

MEOH

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	RPD
CH_3Cl	~~10~~	~~0~~	—	—	—	—	—
CH_3Br	10		9.6	96	11	110	14
Vinyl Cl.	10		9.1	91	9.1	91	0
Cl. Ethane	20		19	95	19	95	0
DCM	10	1.1	10	89	11	99	11
1,1-DCE =		0	9.5	95	9.8	98	3.1
1,1-DCE			9.7	97	10	100	3.0
t-1,2-DCE =			9.9	99	10	100	1.0
$CHCl_3$			10	100	11	110	9.5
1,2-DCE			11	110	11	110	0
1,1,1-TCE			10	100	11	110	9.5
CCl_4			10	100	10	100	0
DCBM			11	110	11	110	0
1,2-DCP			10	100	11	110	9.5
c-1,3-DCP =	20	1.1	21	100	21	100	0
TCE =							
DBCM							
1,1,2-TCE	30	0	33	110	33	110	0
t-1,3-DCP =							
2-CEVE	40	0	51	128	50	125	2.4
$CHBr_3$	10	0	11	110	12	120	8.7
1,1,2,2-TCE =	20	2.4	21	93	22	98	5.2
1,1,2,2-TCE							
1,3-DCB	10	1.2	11	98	11	98	0
1,2-DCB		0	11	110	11	110	0
1,4-DCB		0	11	110	11	110	0
tert-BME	0	0	~~0~~	~~0~~	~~0~~	~~0~~	—
Benzene	10		11	110	10	100	9.5
Toluene			11	110	10	100	9.5
CB			11	110	11	110	0
EB		2.4	9.8	74	9.9	75	1.3
m-Xylene	30	3.2	31	93	31	93	0
o,p-Xylene							
1,3-DCB	10	1.2	11	98	11	98	0
1,2-DCB		0	11	110	11	110	0
1,4-DCB		0	11	110	11	110	0

gnR159B/Forms/11

QUALITY ASSURANCE

Date: 12/4/86
Spike #: 1-23 @ 10 ppb

Sample #: 37586
Client: Moody AFB
Analysis: 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec
CH_3Cl	10	0	12	120	12	120
CH_3Br			9.6	96	9.9	99
Vinyl Cl.			9.4	94	9.0	90
Cl. Ethane	20		19	95	18	90
DCM	10	5.6	11	54	9.9	43
1,1-DCE =		0	8.2	82	7.9	79
1,1-DCE			8.6	86	8.5	85
t-1,2-DCE =			9.3	93	8.9	89
$CHCl_3$		1.2	9.3	81	11	98
1,2-DCE		0	9.0	90	9.1	91
1,1,1-TCE		1.5	9.4	79	9.0	89
CCl_4		0	8.6	86	8.8	88
DCBM			8.6	86	8.6	86
1,2-DCP			8.8	88	8.6	86
c-1,3-DCP = / TCE =	20		16	80	17	85
DBCM / 1,1,2-TCE / t-1,3-DCP =	30		24	80	25	83
2-CEVE	40		39	98	30	75
$CHBr_3$	~~40~~ 10		7.5	75	7.4	74
1,1,2,2-TCE = / 1,1,2,2-TCE	20	1.1	14	65	15	70
1,3-DCB	10	0	4.0	40	4.9	49
1,2-DCB			3.9	39	4.7	47
1,4-DCB			4.0	40	5.0	50
tert-BME	0	0	—	—	—	—
Benzene	10	8.7	22	130	16	73
Toluene		1.4	13	120	11	96
CB		0	11	110	9.9	99
EB		19	30	110	27	80
m-Xylene / o,p-Xylene	30	75	110	117	92	57
1,3-DCB	10	0	10	100	8	80
1,2-DCB / 1,4-DCB			13	65	14	70

gnR159B/Forms/11

GC#1 water confirmation **QUALITY ASSURANCE**

Date: 12/16/86
Spike #: 1-23 at 10ppb

Sample #: 37801
Client: Moody AFB
Analysis: 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec
CH_3Cl	10	0	11	110	8.8	88
CH_3Br	10		11	110	12	120
Vinyl Cl.	10		9.7	97	10	100
Cl. Ethane	20		20	100	21	105
DCM	10		10	100	11	110
1,1-DCE =			9.7	97	11	110
1,1-DCE			10	100	10	100
t-1,2-DCE =			10	100	11	110
$CHCl_3$			10	100	10	100
1,2-DCE			10	100	11	110
1,1,1-TCE			10	100	10	100
CCl_4			10	100	11	110
DCBM			10	100	11	110
1,2-DCP			10	100	11	110
c-1,3-DCP =	20		20	100	22	110
TCE =						
DBCM						
1,1,2-TCE	30		30	100	34	113
t-1,3-DCP =						
2-CEVE	40		39	98	52	130
$CHBr_3$	10		10	100	13	130
1,1,2,2-TCE =	20		20	100	23	115
1,1,2,2-TCE						
1,3-DCB	10		10	100	11	110
1,2-DCB			9.7	97	10	100
1,4-DCB			10	100	11	110
tert-BME	0	0	0	—	0	—
Benzene	10	32	41	90	41	90
Toluene	10	0	9.6	96	9.9	99
CB	10	0	9.1	91	9.5	95
EB	10	3.2	7.7	45	12	88
m-Xylene	30	6	33	90	33	90
o,p-Xylene						
1,3-DCB	10	0	9.7	97	10	100
1,2-DCB			9.7	97	10	100
1,4-DCB			9.8	98	10	100

GC#1 Soil MeOH confirmation

QUALITY ASSURANCE

Date: 12/16/86
Spike #: 1-23 at 10ppb

Sample #: 37763
Client: Moody AFB
Analysis: 601/602

Parameter	Amt Spike Added (ppb)	Sample Value (ppb)	Spike Value (ppb)	% Rec	Dup Spike Value (ppb)	% Rec	R
CH_3Cl	10	0	11	110	10	100	
CH_3Br	10		11	110	11	110	
Vinyl Cl.	10		10	100	10	100	
Cl. Ethane	20		21	105	21	105	
DCM	10		11	110	11	110	
1,1-DCE =			10	100	11	110	
1,1-DCE			11	110	11	110	
t-1,2-DCE =			11	110	11	110	
$CHCl_3$			11	110	11	110	
1,2-DCE			10	100	11	110	
1,1,1-TCE			11	110	11	110	
CCl_4			10	100	11	110	
DCBM			10	100	11	110	
1,2-DCP			10	100	11	110	
c-1,3-DCP = / TCE =	20		21	105	21	105	
DBCM / 1,1,2-TCE / t-1,3-DCP =	30		32	107	33	110	
2-CEVE	40		15	38	14	35	
$CHBr_3$	10		9.1	91	9.7	97	
1,1,2,2-TCE = / 1,1,2,2-TCE	20		21	105	22	110	
1,3-DCB	10		11	110	11	110	
1,2-DCB			11	110	11	110	
1,4-DCB			10	100	11	110	
tert-BME	0						
Benzene	10		9.9	99	10	100	
Toluene			9.1	91	9.3	93	
CB			7.3	73	7.4	74	
EB			7.5	75	7.6	76	
m-Xylene / o,p-Xylene	30		29	97	30	100	
1,3-DCB	10		9.8	98	10	100	
1,2-DCB			9.8	98	10	100	
1,4-DCB			9.7	97	10	100	

gnR159B/Forms/11

CHROMATOGRAPHIC CONDITIONS

CHROMATOGRAPHIC CONDITIONS -

PRIMARY/ANALYTICAL COLUMN

Initial Temp = 20°C

Hold Time = 0 min

Ramping Rate = 4° C/min

Final Temp = 120°C

Final Hold Time = 25 min

Carrier (He) Flowrate = 5 ml/min

Detector Temperature = 250° C

Purge Time = 11 min

Purge Flow = 40 ml/min

Desorb Time = 4 min

Bake Time = 11 min.

Column = 30 meter DB-624 Megabore Fused Silica
Capillary Column

GC = Varian 6000

Trap = Tenax, Silica Gel and Charcoal

Detectors = PID and HALL in series

CHROMATOGRAPHIC CONDITIONS -

CONFIRMATION COLUMN

Initial Temp = 45°C

Hold Time = 3 min

Ramping Rate = 8° C/min

Final Temp = 220° C

Final Hold Time = 25 min

Carrier (He) Flowrate = 30 ml/min

Detector Temperature = 250° C

Purge Time = 11 min

Purge Flow = 40 ml/min

Desorb Time = 4 min

Bake Time = 11 min

Column = 1% SP-1000 60/80 Carbopack B

GC = Varian 6000

Trap = Tenax, Silica Gel and Charcoal

Detector = PID and HALL in series

INORGANIC

QA/QC DATA

MEMORANDUM

TO: DON NASH/GNV

FROM: Kelly Cook ~~DENNIS SHELTON~~/CVO

DATE: FEBRUARY 12, 1987

PROJECT: GN21222.C0

RE: Quality Assurance/Quality Control data for Moody A.F.B. samples numbered 4247-1 through 4247-25.
(37748-37752, 37762-37768, 37804-37810, 37824-37829)

Parameter	Spike Value mg/l	% Spike Recovery	10% Duplicate % Relative Deviation
Arsenic, As	0.025	96	<1
Lead, Pb	0.025	90	@ Det. limit
Mercury, Hg	0.001	127	@ Det. limit
Selenium, Se	0.025	84	@ Det. limit

< Indicates "less than".

jlmk

Engineers
Planners
Economists
Scientists

MOODY AIR FORCE BASE
QC/QA Summary

Analysis Description	Mean Accuracy % Recovery	Matrix Spike % Recovery	Duplicate Analysis RPD
Antimony	107	64	0
Beryllium	106	95	8
Cadmium	95	104	3
Chromium	96	104	41
Copper	97	96	20
Lead	101	81	35
Nickel	98	80	30
Silver	98	81	142
Thallium	87	81	0
Zinc	101	101	24

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